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1894/95

The Annual Report

—OF THE—

Maryland Agricultural
... College ...

And the Experiment Station.

For the year ending

June 30, 1895.

=====
PRESS OF
THOMAS & EVANS,
BALTIMORE, MD.

1895.

The Annual Report

—OF THE—

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UNIVERSITY OF MARYLAND

Maryland Agricultural ... College, ...

For the year ending

June 30, 1895.

PRESS OF
THOMAS & EVANS,
BALTIMORE, MD.

1895.

COLLEGE PARK, PRINCE GEORGE'S COUNTY, MD.,
JANUARY 1st, 1894.

TO HIS EXCELLENCY,
LLOYD LOWNDES, GOVERNOR,
BALTIMORE, MD.

SIR:—

Under instructions from the Board of Trustees, and on behalf of its Executive Committee, I have the honor herewith to transmit to you for presentation to the General Assembly, the Annual Report of the Maryland Agricultural College for the year ending June 30, 1895. It is hoped that this report will be accepted as fulfilling the requirements of the law (extract below) for a "full and correct report of the said Agricultural College" to every session of the State Legislature. And it is recommended that the printing of the same be authorized by the General Assembly, that the people of the State may become better acquainted with the educational advantages offered by the College.

As Acts of Congress now require that Annual Reports be made to the Governor and other officials, from this institution, as one of the conditions of Federal support, it is further recommended that the General Assembly should authorize the Governor to cause these publications to be regularly made hereafter by the State.

Very respectfully,

ROBT. P. GRAHAM,
Chairman Executive Committee.

EXTRACTS FROM THE LAWS RELATING TO REPORTS TO BE MADE BY
THE MARYLAND AGRICULTURAL COLLEGE.

(Maryland Laws of 1856, CHAPTER 97, Sec. 7.)

By the College Charter the Board of Trustees is required to present to every session of the State Legislature "a full and correct report of the condition of said Agricultural College and Model Farm; and the condition or final results of all experiments undertaken."

(Maryland Laws of 1865, CHAPTER 178, Sec. 1.)

This Act assigns to the Maryland Agricultural College the benefits of the Congressional Land-Grant of 1862, and provides as follows: "and the said College shall, in all respects, comply with the several requirements of the said Act, as to making and recording experiments and reporting the same."

MARYLAND AGRICULTURAL COLLEGE,
OFFICE OF THE PRESIDENT,
COLLEGE PARK, MD., January 1st, 1896.

CHAIRMAN OF THE EXECUTIVE COMMITTEE,
OF THE BOARD OF TRUSTEES,

SIR:—

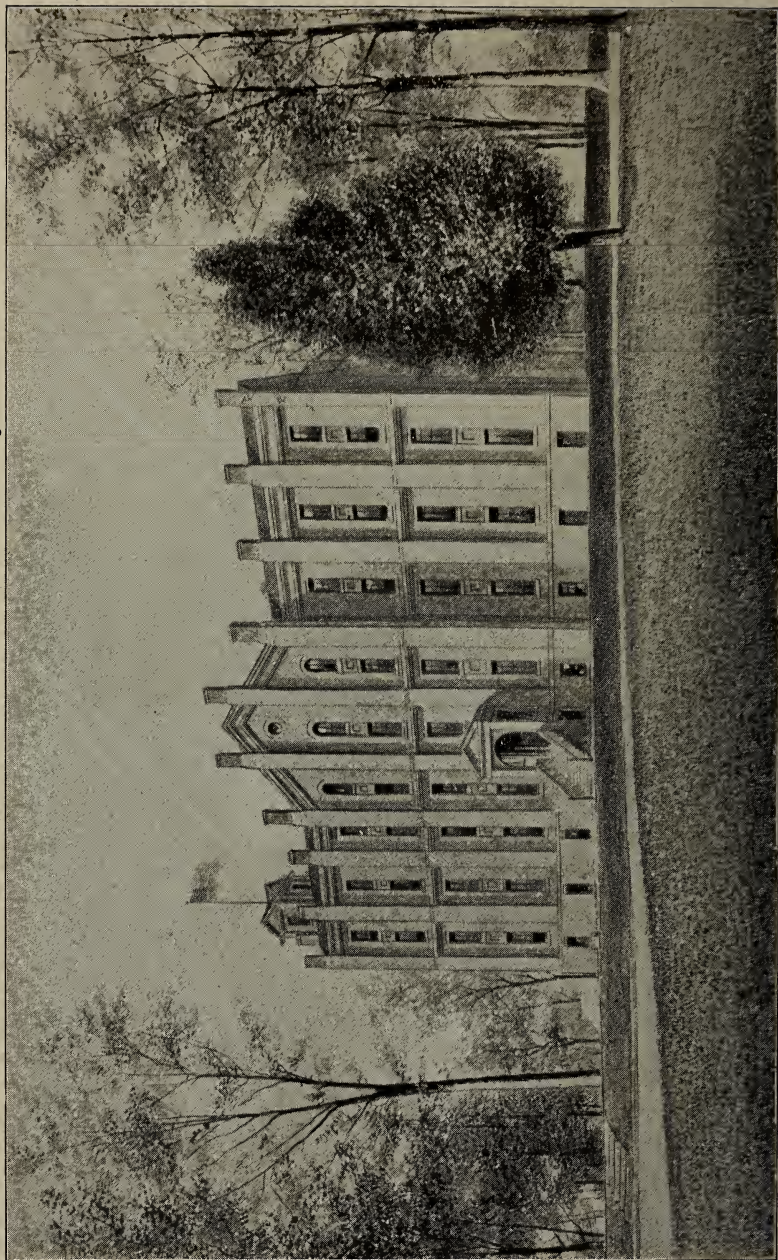
Complying with the order of the Board of Trustees, I have the honor to transmit to you the Annual Report of the Maryland Agricultural College for the year ending June 30, 1895, as prepared by me in accordance with existing laws, extracts from which are also herewith submitted.

This report comprises a “full and correct” account of the “condition of the College” during the two years which have elapsed since the report made by the Board of Trustees to the General Assembly of 1894, and published by its authority.

Yours very respectfully,

R. W. SILVESTER,

President Maryland Agricultural College.



MARYLAND AGRICULTURAL COLLEGE, PRESENT BUILDING—ONE WING OF PROPOSED BUILDING.

ANNUAL REPORT

—OF THE—

Maryland Agricultural College,

1895.

By Act of Congress, as set forth in preceding extracts from the laws of Congress, it is obligatory upon each of the Land-Grant Colleges to present an annual report to the Secretary of Agriculture and of the Interior. The laws of the State make a like requirement for each Bien-nial Session of the Legislature. In obedience to these laws, the following report in detail is hereby made:

The Experiment Station, by order of the Board of Trustees, (see extract of proceedings, June, 1892,) was placed on an independent footing, and hence, this report will have nothing to say of its present condition and progress, save the statement that the wisdom of the act of separation, whereby the time and attention of a competent executive can be exclusively devoted to it, is plainly shown in its present thriving and prosperous condition, and in the growing confidence it is obtaining in all sections of the State. It will be well to call particular attention to the fact that although the Experiment Station is, by the provisions of the Hatch Act, a department of the College, still, by order of the Board of Control, each is now conducted by an independent executive, each with its own autonomy. This statement is made in justice to the Director of the Station, his good work being frequently attributed to the College.

CONDITION AND PROGRESS OF THE COLLEGE, 1895.

For a comparison of work, this report will be cast somewhat after the same formula as that of 1892-93. Most gratifying progress has marked every phase of College life during the past year. The attendance of students marks the interest and appreciation of the general public. The course of study has been enlarged to embrace, instead of one, four lines of work, as the following pages illustrate. The standard of scholarship has been considerably advanced. An *esprit de corps* is established among the students, which makes the body well nigh self-regulating; not one instance of gross breach of discipline having occurred during the year. In fine, the management of the College has every reason to congratulate itself and the people of the State upon the healthy state of affairs now existing in their State College.

ATTENDANCE OF STUDENTS.

The comparison of the report of 1891 and '93, continued.

Enrolled in the calendar year 1891.....	82
“ “ “ “ 1892	125
“ “ “ “ 1893.....	144
“ “ “ “ 1894.....	182
“ “ “ “ 1895.....	185

Additional comparisons.

Average last 10 years, up to 1891.....	30
“ “ 4 “ “ 1891.....	40
Autumn, 1891.....	62
“ 1892.....	108
“ 1893.....	120
“ 1894.....	141
“ 1895.....	120

The apparent decrease in autumn, 1895, from the number enrolled in autumn 1894, is explained by the fact that the dormitory on the top floor of the College building, which was arranged to accommodate about twenty additional students in the autumn of 1895, was found to be not at all satisfactory or suitable for the purpose, and its use as a dormitory was abandoned, and the engineering department sorely crippled for rooms given these quarters. As a consequence many applicants had to be turned away for lack of room, the College accommodations being now taxed to their utmost.

From the above recapitulation it is seen at a glance how greatly the attendance has increased, and in this connection permit it to be said that during the scholastic years of 1892-1893, 1893-1894, 1894-1895, and in the fall of 1896, there have been many applicants for admission—upwards of a hundred, in fact—for whom there was no possible accommodation. It remains for the people of the State to say, through their representatives, whether this state of things shall continue. Certainly the only distinctively marked State College, with ample endowment to pay the expenses of instruction and for purchasing facilities for the same, will not be compelled to turn from its doors, for want of room, the youths of the State seeking instruction within its walls.

The spirit of the institution is now true to its name. Agriculture and the Mechanic Arts are the emphasized courses of instruction, and, although an option is granted in two other courses, one scientific and the other classical, still the percentage of students pursuing this last is small as compared with the others.

The Mechanical course is now well established. The Mechanical building, completed during the past year, gives accommodation to this important department. This building has been equipped as rapidly as available funds would permit. The wood working department and the drafting room have each been supplied with all necessary articles for commencing a course leading to an advanced degree in mechanical engineering. It is not the intention of this department of the State College to give merely a superficial knowledge of manual training, but rather to give to those asking mechanical instruction such information

as is given in our advanced schools of technology. In addition to this extended course, there is arranged a shorter one for those taking the Agricultural course. It is a well accepted fact that a certain amount of mechanics is necessary for the fully equipped agriculturalist, and this has been the end and aim of the policy governing your institution for the past four years. Your attention is called to the Mechanical building in all of its practical details. The building is well worthy a special appropriation for its complete equipment. This department is particularly fortunate in securing the services of Lieut. J. D. Ford, of the United States Navy. It was his fitness for this line of work which laid the foundation for the present School of Technology in Baltimore. If you should be able to retain him, there can be no doubt about the final success of your Mechanical Engineering Department.

The building for the Department of Physical Culture and Library has been invaluable to your institution. Under the training given a decided advance in physical development has been noted, and the general health of the student body has been greatly improved. The Library in the building is slowly increasing. Several valuable additions have been made to the same by gifts from those interested in its progress. An account of these will be found under the title of donations to the College. The small fund which is available for the Library is for the most part expended in current literature. It is deemed very important that young men graduating from your State College should have a knowledge of those forces shaping the history of their day and generation, and to this end a well equipped reading-room has been established and here the current literature of the day, together with the discussion of all topics pertaining to their country's welfare, invites the eager seeker after knowledge to a gratification of his tastes. A new heating plant has replaced the old one. In supplying this need a conception of future wants was taken into consideration. Two 60 horse-power water-tube boilers were put up. One of these affords steam sufficient to heat all the buildings on the premises, and the other is held in reserve for the power necessary to run the machinery of the Mechanical building and the dynamo, which is contemplated to supplement the present gas plant. This gas plant replaced the dangerous coal oil lamps. Your examination of this plant is respectfully asked.

Many other additions to the better equipment of the institution have been made. The entire interior of the building has been renovated, bath rooms and water closets supplied and fire escapes on the north end of the building added. The Chemical Department has had many additions and changes which greatly facilitate this important work; especially that department of it which refers to fertilizer work. The farm equipment, from the point of tools to that of live stock, was entirely inadequate for the proper management of the place. At much expense the situation has changed. A fair equipment is on hand and all is paid for.

SOME PRESSING NEEDS.

First—A suitable barn for the housing of stock, implements and food. The present accommodations are a disgrace to the State. It is

earnestly recommended that measures be taken at once to secure this most important addition to your institution.

Second—A Laboratory building for the chemical work is an equally pressing need. The present quarters are entirely inadequate for the work being done. The fertilizer work in the State—than which there is none more important to the agricultural interests—needs more room and better accommodations. The operations of the present fertilizer law has been very effective. It affords the protection needed and is greatly appreciated by the agriculturalists throughout the State. The educational section of the Chemical Department is at present occupying a building which your inspection will demonstrate to be thoroughly unfit for the purpose to which it is put. A new building is needed for this department, and some method of securing the means for the same should now engage your attention.

Third—The present College building has much of its room occupied by the professors and their families. Some provision should be made for quarters for the professors, and thus the main building could be devoted exclusively to students and those concerned directly in their control. I would suggest the building of several cottages on the premises for this purpose and thus relieve this tension.

Fourth—A better water supply is needed. Provision will have to be made for this before the commencement of another year.

These pressing needs can be supplied if an appropriation of fifteen thousand dollars (\$15,000) can be secured at this meeting of the Legislature. In comparison with what other States are doing for their Agricultural College, and in view of the great interest which the College represents, this appropriation is small, as to the amount asked, and it is to be hoped that the present Board of Trustees will be so interested in the welfare of the College and its future usefulness as to use every means to secure this much needed legislation.

I feel fully justified in saying that the agricultural interests of the State are heartily in favor of these improvements. Visiting clubs, Grange committees and other farmers' organizations have expressed themselves time and again as being in full accord with the sentiments here expressed. This interest is certainly entitled to some consideration at the hands of the State, and the present Board of Trustees could certainly not find a more worthy cause to father or a greater interest more in need of the sustaining hand of legislation.

The State of Maryland, through its accredited agents, never backward in placing herself among the foremost in the sisterhood of States, will, it is hoped, not lose the opportunity to make her State College among the best to be found in the country. Other States are doing the work nobly, not a few making their appropriations many times what Maryland is giving hers. Pennsylvania, notably among many, giving \$175,000 one year, in order to better accommodate those applying, and better to equip the departments for the wonderful work before them.

With these needs, supplied, in addition to our desirable location, it can be but a few years before this institution will be the peer of any similar one in the land. The peculiar work of this College marks it with proper management, as one assured of success. When its mission is once

thoroughly understood, it will be duly appreciated, and in the educational field will be welcomed as a valuable coadjutor in the development of the best interests of Maryland. Much co-operative work commenced will be duly continued.

The attention of the President of this Board has been directed to a communication from Professor Clark of Johns Hopkins University, regarding the completion of a Geologic Survey of the State. This is a very important matter, and should engage the serious attention of the law-making power of our State Government. On an accurate map of our State, of this nature, much of its prosperity depends. The attention of the board is called to the importance of this matter. They could do the State no greater service than to assist the State Weather Service and the Johns Hopkins University in carrying out the scheme so well outlined by Professor Clark.

The following statements give in detail many important facts concerning the institution. A careful perusal of the same will clear up many misconceptions concerning the College, its sources of income, the appropriation of same, etc.

It is right and proper that every citizen of Maryland should have an intimate acquaintance with every detail of the College management. With this in their possession, much criticism, based upon mere hearsay evidence, would be eliminated. It is neither desirable nor possible to escape the judgment of other men. It is desirable, however, to have these judgments based upon the facts as they exist.

MARYLAND AGRICULTURAL COLLEGE.

Office of President.

STATEMENT "C."

Number of students entered 1891-2.....	65
“ “ “ “ 1892-3.....	108
“ “ “ “ 1893-4.....	122
“ “ “ “ 1894-5.....	141
Receipts of students of 1891-2.....	\$4,639 72
“ “ “ “ 1892-3.....	8,609 35
“ “ “ “ 1893-4.....	11,710 61
“ “ “ “ 1894-5.....	14,441 47

It should be noted that in regard to the above statement of the expenses for each student, he enjoys all the advantages offered by the College for the small sum here named: his board, room, books, heat, light, washing, medical attention, use of apparatus, library, gymnasium and his tuition. This is a sum less than he could be well boarded for at home.

THE REPORT OF COLLEGE TREASURER.

FROM JULY 1st, 1893, TO JUNE 30th, 1894.

JOSEPH R. OWENS, TREASURER, IN ACCOUNT WITH THE MARYLAND AGRICULTURAL COLLEGE.

DR.

CR.

SOURCE OF REVENUE.		CASH BOOK.		NATURE OF EXPENSES.		LEDGER.	
Balance of Cash on hand July 1, 1893.....		8					
		LEDGER.					
Students		176	\$ 2,602.69	Domestic Department.....		135	\$15,290.13
Boarders, not Students.....		173	11,710 61	Salaries		139	15,865 00
United States, Act of August 30, 1890.....		168	3 280.22	General Expenses and Board Meetings...		139	2,175.29
State of Maryland		177	19,000.00	Repairs and Returnings.....		141	913.39
Land-Grant Fund		169	6,000 00	Eastern Branch.....		147	3,623.39
Fertilizer License Fees.....		178	6,141 30	Mechanic Arts.....		148	850.53
College Farm		180	3,381.37	Advertising, Insurance and Taxes		149	830.28
Sundry Receipts.....		171	3,990.79	Fertilizer Supervision		150	551.24
Old Debts, Students' Account 1892-93.....		179	717.07	Chemical Department		151	644.31
			200.47	Debt Certificates Cancelled.....		153	5,000.00
				Sundry Expenses.....		153	488.21
				Mathematical Department.....		154	70.60
				Agricultural Department.....		155	1,597.53
				English Department		156	92.62
				Classical Department		157	149.03
				Department of Physics.....		158	79.05
				Natural History Department.....		159	100.51
				Equipment.....		160	2,450 73
				Preparatory Department.....		161	1,000.00
				Military Department.....		162	148.99
				Library.....		163	327.89
				Gymnasium and Physical Culture.....		164	684.16
				Permanent Improvements.....		165	1,441 64
				Lectures and Special Instruction.....		166	1,622.10
				Equipment		167	319.50
				Balance in Cash Carried to next Year. ..		CASH BOOK.	274.50
Total.....			\$57,064.52	Total.....		69	3.70
							\$57,064.52

We, the undersigned, duly appointed auditors for the corporation, do hereby certify that we have examined the books and accounts of Joseph R. Owens, Treasurer of the Maryland Agricultural College, for the fiscal year ended June 30, (1894 and 1893, respectively); that we have found the same correct, and showing receipts and disbursements as specified in the above exhibit, for all of which disbursements proper vouchers are on file, and that we find a balance of cash unexpended, amounting to (\$3.70 and \$86.15 respectively), which sum is to be accounted for by the said Treasurer in his account with the College for the fiscal year, commencing July 1, (1894 and 1893, respectively).

CHARLES B. CALVERT, } *Auditing Committee,*
J. B. SILVER, } *Board of Trustees.*

True extract from the College Ledgers.

JOSEPH R. OWENS, *Treasurer,*

THE REPORT OF COLLEGE TREASURER.

FROM JULY 1st, 1894, TO JUNE 30th, 1895.

JOSEPH R. OWENS, TREASURER, IN ACCOUNT WITH THE MARYLAND AGRICULTURAL COLLEGE.

DR.

CR.

SOURCES OF REVENUE.	CASH BOOK	NATURE OF EXPENSES.	LEDGER.	
Balance of Cash on hand July 1, 1894.....	72 LEDGER.	Domestic Department	187	\$18,447.34
Students.....	228	Salaries.....	193	17,871.07
Boarders, not Students.....	218	Repairs and Refinishings.....	192	614.10
United States, Act of August 30, 1890.....	221	Eastern Branch.....	198	3,770.43
Interest on Investments.....	223	Advertising, Insurance and Taxes.....	200	3,883.53
State of Maryland.....	222	Permanent Improvements.....	201	1,020.38
Fertilizer License Fees.	224	General Expenses.....	201	1,777.12
College Farm.....	217	Gymnasium Building.....	204	5,000.00
Sundry Receipts.....	220	Repairs of President's Dwelling.....	204	537.54
Old Debts, Students, prior Years.....	229	Mechanical Building.....	205	5,314.51
		Heating and Lighting Buildings.....	212	5,125.43
		Agricultural Department.....	211	201.36
		Classical Department.....	208	102.81
		English Department.....	209	79.32
		Mathematical Department.....	209	131.11
		Military Department.....	210	147.15
		Preparatory Department.....	210	70.18
		Department of Physics.....	211	76.43
		Department of Natural History.....	211	108.33
		Horticultural Department.....	213	141.82
		Chemical Department.....	214	5,349.14
		Department of Physical Culture.....	213	304.98
		Library.....	212	389.74
		Lectures and Sundry Services.....	213	297.50
		College Farm.....	212	3,700.01
		Equipment.....	214	1,000.00
		Sundries.....	215	854.05
		Balance Unexpended June 30, 1895.....	203	486.15
Total.....	\$73 531 43	Total.....		\$73,531.43

We, the undersigned, duly appointed auditors for the corporation do hereby certify that we have examined the books and accounts of Joseph R. Owens, Treasurer of the Maryland Agricultural College, for the fiscal year ended June 30, (1894 and 1895, respectively); that we have found the same correct, and showing receipts and disbursements as specified in the above exhibit, for all of which disbursements proper vouchers are on file, and that we find a balance of cash unexpended, amounting to \$83.70 and \$486.15, respectively, which sum is to be accounted for by the said Treasurer in his account with the College for the fiscal year, commencing July 1, (1894 and 1895, respectively).

CHARLES B. CALVERT, } Auditing Committee,
J. P. SILVER, } Board of Trustees.

True extract from the College Ledgers.

JOSEPH R. OWENS, Treasurer.

It will be noticed that there are five sources of income to the institution.

First.—State donations, the only source from which we can obtain means for repairing, refurnishing or building. This is evidently inadequate to meet the wants of the institution.

Second.—First Morrill Act, to be applied alone to instruction and facilities for the same.

Third.—Second Morrill Act, to be applied alone to instruction and facilities for the same in Agriculture, Mechanic Arts and kindred topics.

Fourth.—Fees, under the Commercial Fertilizer Law, to meet the expenses of collecting and analyzing the different samples sold in the State.

Fifth.—The income from students and board of professors. We cannot hope to realize anything from this source to aid in the general expenses of the institution. We have twenty-six students who only pay \$45 for nine months, the regular students pay \$140.00 for a like period, and in consideration of this each student is furnished with every need except clothing. At such sums we can only hope to meet the expenses of the domestic department.

From the foregoing it is plainly evident that, if we wish to make the State College of Maryland, with its many advantages a source of genuine State pride, by causing it to take rank with the first of its kind in America, the State must deal more liberally with it in the future than it has in the past. Maryland is world-renowned for her many philanthropic enterprises. Its unfortunates are kindly taken care of in all instances. Would it not be a sound financial policy to exercise liberality towards this institution, whose function it is to decrease the number of these unfortunates, by making each one coming to it for guidance, a self-supporting member of society, asking only a fair chance in the race of life?

COLLEGE BUILDINGS.

Cuts of these will be found in different parts of this report. The present building, intended in the beginning to be only one wing of the main building, but poorly meets the requirements of the State College. A cut of the building as originally designated is herewith given, and it is hoped it will so stimulate the State pride as to cause steps to be taken at once to complete the work so wisely begun over a third of a century ago. If this be done, the citizens of Maryland may confidently look to the Agricultural College to become a large factor in their best interests. Is it too much to hope that this will be fully realized at this time, and that the College may be at once placed upon the plane where its greatest power for usefulness may be realized?

THE COLLEGE FARM.

Many ideas prevail as to what the function of this important department should be. It is impossible to have it measure up to the standard outlined for it by individual ideas. Each man engaged in agriculture has his own plans and his own measures by which he estimates success or failure, and is apt to view with suspicion any management in-

capable of being measured by his own standard. The College farm has been in the past regarded as the *bete noir* of those in charge. From the account given in the report of 1891-2, much had been done in the years preceding to put it in the condition in which it was found. Certainly much then remained to be done, in order that a reasonable hope might be entertained of much return from tilling the same. The fencing on the place, with the exception of that on the Experiment Station grounds, would hardly deserve the name. Ditches were closed, and the land suffered from a long continuance of standing water. The field to the east of the College was found in fair grass. The remainder of the farm was very poor pasture for the few cattle found upon the premises.

During the past three years, experience has given evidence that with care and close attention the College farm is capable of giving good returns from its tillage. The soil is sadly in need of three things: 1st.—Thorough drainage; 2nd.—Humus; 3d.—Lime. Where these desiderata have been supplied, we have found a ready and gratifying response to intelligent cultivation.

Your attention is respectfully called to the statement of the sales account from the farm. Upon this record the management of the farm rests. It is to be greatly regretted that there is not more land for College purposes. During a portion of the College history, its necessities lead to the sale of some of its acreage. Should the opportunity present itself, I should recommend the purchase of some adjacent tracts. More land is needed to carry out the scheme of a model farm, on which all the agricultural interests of Maryland may be represented.

In our farming operations the students have been given practical instruction in all the details of plant culture. With the experience which these years have afforded, I am not prepared to say that the College farm is unfit for its purpose. I have found its soil of many formations, and with a close study of its needs from a chemical and physical standpoint, and consideration for the proper methods for its culture, it yields readily and well to the hands of the sower. Its capacity to yield wheat is shown from the record of the Experiment Station Bulletin. The early vegetables raised in abundance bespeak the prompt returns from care and thoughtfulness; in fine, I fear the neglect of former years, and the poor return as a result of it, have lead to the unjust estimate formed. Now it is perfectly true that the character of the soil could be better. The soft, alluvial lands of the river courses of the Eastern Shore and Southern Maryland, and the friable red lands of Northern and Western Maryland, would with the same culture and consideration yield better results. I question whether this is desirable. The agricultural literature of Maryland gives the following average yield:

Corn	(per acre for the past ten years.)	24 bushels.
Potatoes	" " " " " "	67 "
Wheat	" " " " " "	12 "
Oats	" " " " " "	20 "

This is sufficient to illustrate the point I wish to make. This low average asserts the fact that the average farm is in a low state of cultivation, and that few men possess the desirable lands referred to. Now the

mission of the College is not only to teach its students that any land can be improved, but that the average soil of the State is susceptible of improvement at a cost that comes within the means of the average farmer. If I mistake not, the soil found on the College farm is nearer the average of that of the whole State than that of a much better quality would be. Such being the case, the conditions of our problem are at hand, and it only awaits solution. Is it too much to ask the people of the State to bear with us with some patience, while our best efforts are expended in this direction? The record of four years work on the farm is here given from books carefully kept. In forming your judgment of this, read carefully this record, and do not forget that the expenses incurred in many instances, are the result of the purchase of necessary plant for making permanent improvements, such as ditching, fencing, improving the grounds, etc.

REPORT OF DEPARTMENTS.

The following reports outline the work of the institution. In those departments where much laboratory work is done, the professors in charge are hampered for lack of room. Facilities for instruction can be supplied, yet their proper use requires space, and in this the College is deficient. This is notably true in the departments of Physics, Botany, Biology, Applied Mathematics and kindred topics. It is to be hoped that the efficiency of the college work will not much longer be hampered by the want of such desiderata. A careful perusal of these reports is asked. They are faithful representations of what is attempted in their several lines.

MATHEMATICAL DEPARTMENT.

Prof. R. W. Silvester, President.

Mathematics is the basis upon which scientific information rests. A knowledge of the study is necessary as much from the utilitarian point of view, as from the mental training its acquisition gives. Its importance as a factor in our College course takes its rise from the former consideration. All instruction in this work is with a view to the equipping of students for the practical work soon to follow.

The uses of Arithmetic, Book-keeping, Algebra, Geometry, (plane and solid), Trigonometry (plane and spherical), are self-confessed. Descriptive Geometry in its application to Mechanical Drawing; Analytical Geometry: Differential and Integral Calculus, in their many and varied applications to Mechanics, Engineering and Physics, each and all speak for themselves in their claim upon the attention of the student who intends to place himself on the vantage ground of an educated man. These are some of the considerations which have led to the continued course of instructions outlined in each of the four courses.

In the applied Mathematics, Book-keeping is taught every student. No matter what vocation a man intends to follow, a knowledge of business forms, and a method of systematic accounts is a *sine qua non* to success.

To be able to use an ordinary compass or transit for the purpose of laying out, dividing and calculating the area of land, or of running out-

lines, and a level for the purpose of drainage, is a necessary qualification of the agriculturalist who wishes success of the highest type to crown his efforts.

In fine, we wish all our theories to bear their fruits. Thus, and thus alone, can we expect to win a place in the confidence and appreciation of an enlightened community.

DEPARTMENT OF ENGLISH AND CIVICS.

Prof. R. H. Alvey, Vice-President.

Instruction in this department seeks to accomplish two distinct and yet closely connected results: to prepare the student, by a course of training in the history, structure and use of the English language, for the highest development of his mental powers, and for the complex business and social relations of life; and further, to fit him for the intelligent exercise of his active duties as a man and a citizen. The work of the department may thus be outlined as two distinct courses of instruction.

Recognizing the fact that training in English is of primary importance to the student in pursuing his studies in all other branches of learning, our effort, from the beginning of his first College year, is to familiarize him with the structure and idioms of the language, and to render him fluent and accurate in its use. In the Freshman Class, continued exercises in synthesis, analysis and practical rhetoric extend throughout the year. Weekly composition work and critical examination of the same serve to render the student more exact in his choice of words, and more easy and natural in his manner of expression. Attention is also given to word-structure, roots, prefixes and suffixes, and to the use of synonyms. The student's power of expression and of interpretation of the thoughts of others is sought to be strengthened by frequent practice with selections from the best English authors.

The Sophomore year is devoted to the study of literature, although rhetorical work in the form of essays upon literary topics runs through the entire year. The study of English literature is topically pursued, with collateral readings from the typical authors of each period. The course is completed by a series of lectures upon American literature.

In the Junior year the subjects of technical rhetoric and logic are taken up. Text-books upon these subjects are supplemented by continuous practical exercises in style and composition and a logical analysis. Essays upon assigned topics are required in each term.

In the Senior year instruction in English takes the form of critical readings from standard authors, with the object of creating and forming in the student some degree of literary taste and culture, that may stimulate and guide him in his reading after leaving College. The thesis work of this year is in the form of papers upon questions of political and social science and current topics.

The course in History proper runs through three years, and leads up to the study of Political Science and Civil Government in the Senior year. In the Freshman year an outline of Ancient History is begun and completed with essays and reference work. The Sophomore Class pursues a course of study in Mediæval and Modern History, with specially

assigned reference work. The Junior Class has recently been slightly advanced in its work, and during the past year has studied the outlines of Civil Government in the United States, with discussions and papers upon current topics. In the first term of the Senior year the class work is the elements of Political Economy and the application of its principles to questions of industrial and social interest. During the second term special topics are assigned for student investigation along the lines of their previous study. Students are encouraged to investigate conscientiously and to formulate their opinions for themselves.

During the first part of the Senior year weekly lectures are delivered to the class upon the Constitution of the United States, its history and the laws made under its sanction.

During the latter part of the term a course of informal, topical lectures upon the elements of municipal and business law, banking, contracts, commercial paper, mortgages, deeds, leases, wills, etc.; the object being to enable the student intelligently to conduct such simple business transactions as any land-owner or taxpayer may be called upon to perform and to avoid, as far as possible, that stumbling-block of so many American farmers, incessant and disastrous litigation.

It is an undisputable fact, that whatever may be the peculiar function of any institution of learning, it must invariably fall short of the fulfillment of its duties to its graduates and to society, if it sends out young-men with no knowledge of the laws under which they live and without a proper conception of the principles and powers of their government. Where such knowledge and such a conception is wanting there can be no proper appreciation of the rights and obligations of citizenship. Especially is this true of Colleges of Agriculture and Mechanic Arts. The educated farmer or mechanic must be an intelligent citizen if he is to be of any real service to that branch of society whose interests he represents. With this idea, our course in Civics is made as comprehensive in scope and as practical in application to every day life as possible.

DEPARTMENT OF AGRICULTURE.

Prof. W. T. L. Taliaferro.

In the Agricultural Department of the College the end sought to be attained is to make of the young men pursuing the course progressive, practical farmers, who comprehending the scientific facts of Agriculture, may, by means of that knowledge, be enabled to raise more wheat or more potatoes from an acre of land, and fatten more beef on a given amount of food.

With this end in view, the course of instruction embraces, so far as is possible, both the theory and practice of agriculture. The theory is taught in the lecture room, by means of improved text books and oral lectures, illustrated by laboratory experiments. The practice is taught in the fields and stables. The practical part is of course, mostly limited to observation and explanation. Even if it were desirable that the students should do the manual work of the farm, it would be impracticable through lack of time. As a matter of fact, a majority of the



VINEYARD AND TOMATO FIELD.

students are familiar with the ordinary farming operations before they enter the College.

Throughout the course an effort is made to impress facts upon the students by means of object lessons, and further to impress upon them that it is only by the application of scientific facts that agriculture and agriculturists can be placed upon the plane where they belong.

The proper construction of a plow, for instance, is shown to depend upon the laws of the inclined plane; the principles of the lever are pointed out in the differing movements of the thoroughbred and cart horse; the result of scientific investigation and the immense advance which has already been made in agriculture in the few years since the time when binders were unknown and artificial fertilizers existed only in the brains of a few theorists, is held up as an earnest of what may yet be done by a judicious application of scientific principles.

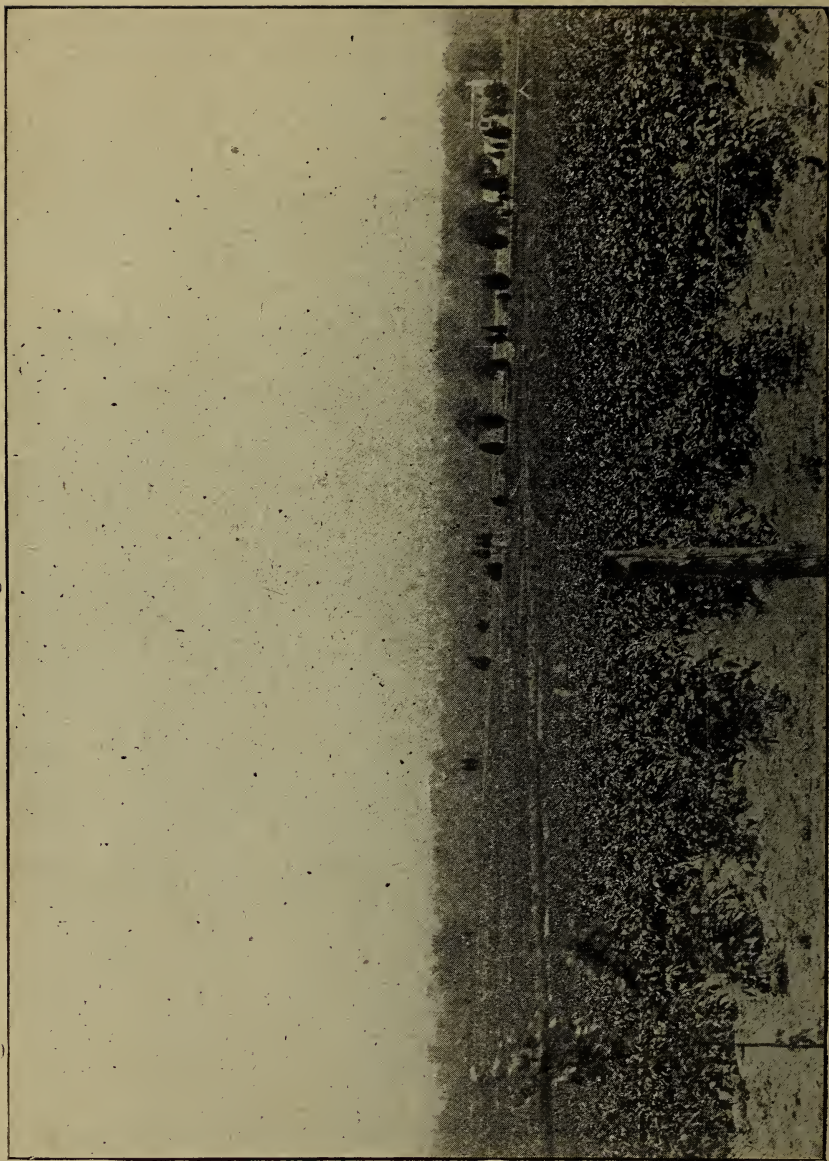
Particular stress has to be laid upon the practical connection between science and agriculture to overcome the prejudice which many boys bring to college against what they have heard decried as "book farming," and which they are apt at first to extend to what ever is new to them.

The same system of instruction is used with each subject. If, for instance, a particular crop, as corn, be under consideration, the plant is first studied in the class room, where its habits, chemical composition and uses are discussed, with the various methods of cultivation.

From time to time, during the preparation and growth of the crop the class is taken to the field where the work is being done, to inspect and perhaps take part in it. Where different fertilizers have been used, or different systems of cultivation employed, the differences are pointed out, and the class encouraged to draw their own deductions as to the effects.

If cattle feeding is being considered, the composition of the animal is first studied, then the composition of the various cattle foods and their digestive co-efficients. From these are deducted a properly balanced ration, and then are shown the effects of proper and improper proportions in actual feeding experiments.

In detail, the course of instruction in the Agricultural Department of the College is as follows: Freshman year, first, a general outline of agriculture, including the preparation of soils, cultivation and saving of crops, care of stock, etc. This is elementary enough to be readily understood, and yet serves as an introduction to the more detailed study of the several divisions of the subject. The study of breeds and stock, the elementary principles of mechanics and crops, occupy the rest of the year. In the Sophomore year the ground covered includes the study of farm implements and machinery, the structure, chemical analysis and manner of growth of plant and the breeding of stock. The work of the Junior year includes the comparative chemistry of soils and plants, plant feeding and the action of fertilizers, soil-physics and drainage. The Senior course is one of specialties, including dairying, stock-feeding, and other forms of animal husbandry, of such advanced topics as the individual students may elect.



VIEW OF EXPERIMENT STATION AND POTATO FIELD.

A SHORT WINTER COURSE IN AGRICULTURE.

(Founded upon a system organized by the Missouri State University.)

Realizing the great value of correct methods, based upon scientific investigation, in the profession of agriculture, and being animated by an earnest desire to do something to overcome in a measure the adverse results attendant upon its pursuit, incident to the present methods in vogue, the Agricultural College of Maryland, through its departments of education and experimentation, has deemed it advisable to start a short winter course in agriculture for the purpose of placing within the reach of those not having the time or money to pursue the regular course the opportunity of gaining the information so necessary for the successful prosecution of their work.

It is hardly to be expected that much more can be done for the coming winter than the presentation of a scheme for this work, and to offer to the young men of Maryland, who cannot afford the time or money for a full College course, an opportunity to fit themselves more thoroughly for the practice of the profession to which they have devoted their lives.

The course will be open to all young men over 16 years of age. No entrance examination will be required. The aims of the course will be to give the largest amount of purely practical information about farming in all its phases: Dairying, Gardening, Fruit-growing, Veterinary Science, Carpentry, Blacksmithing, Culture of Crops, Fertilization, Harvesting and Marketing. The instruction will be given principally through lectures; the practical features will be carried on in the fields, laboratories, greenhouse, dairy buildings and barn. The course will be of six weeks' duration—five days to the week and three lectures per day—commencing Monday, January 20, 1896. Practical work in the laboratories will also claim a portion of each day.

OUTLINE OF LECTURES FOR WINTER COURSE IN AGRICULTURE.

Farm Crops (eight lectures).

1. Cultivation as affecting
 - (a) The physical condition of the soil;
 - (b) The chemical condition of the soil;
 - (c) The water content of the soil.
2. Plant Feeding and the Rotation of Crops.
3. Clovers—
 - (a) Varieties;
 - (b) Uses;
 - (c) Cultivation.
4. Small Grains—
 - (a) History;
 - (b) Cultivation;
 - (c) Harvesting;
 - (d) Fertilizing.



Pietertje de Kol Prince 17001. Heading the Holstein Herd—2050 Pounds, February 5th, 1896, 4 Years old.

5. Corn—

- (a) History ;
- (b) Cultivation ;
- (c) Harvesting ;
- (d) Fertilizing.

6. Grasses—

- (a) Varieties ;
- (b) Cultivation ;
- (c) Harvesting ;
- (d) Fertilizing.

7. Silage and Forage Crops.

8. Potatoes and Root Crops.

Drainage (five lectures).

1. (a) Lands which need drainage.
(b) Indications of too much water.
(c) Sources of surplus water.
(d) Objections to too much water.
2. The effect of drainage on the physical condition of the soil.
3. The effect of drainage on the chemical condition of the soil.
4. Drainage as effecting particularly the washing of lands and the health of localities.
5. Methods and cost of drainage.

Breeds and Breeding (ten lectures).

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| 1. Breeds of Horses. | 6. Heredity. |
| 2. Breeds of Dairy Cattle. | 7. Variation. |
| 3. Breeds of Beef Cattle. | 8. Correlation. |
| 4. Breeds of Sheep. | 9. In-and-in Breeding. |
| 5. Breeds of Swine. | 10. Cross Breeding. |

By W. T. L. TALIAFERRO.

Stock Feeding (eight lectures).—The composition and digestibility of the different feeding stuffs. What is meant by a well balanced ration and the calculation of such rations with given materials. Feeding for maintenance, fat, butter, eggs, wool, milk. The effect of food on quality. The preservation and preparation of course fodders. Ensilage. Steaming and cooking food, etc., etc. Not only will the theory be studied, but a careful carrying out of the theory in practice will be the features of the course.

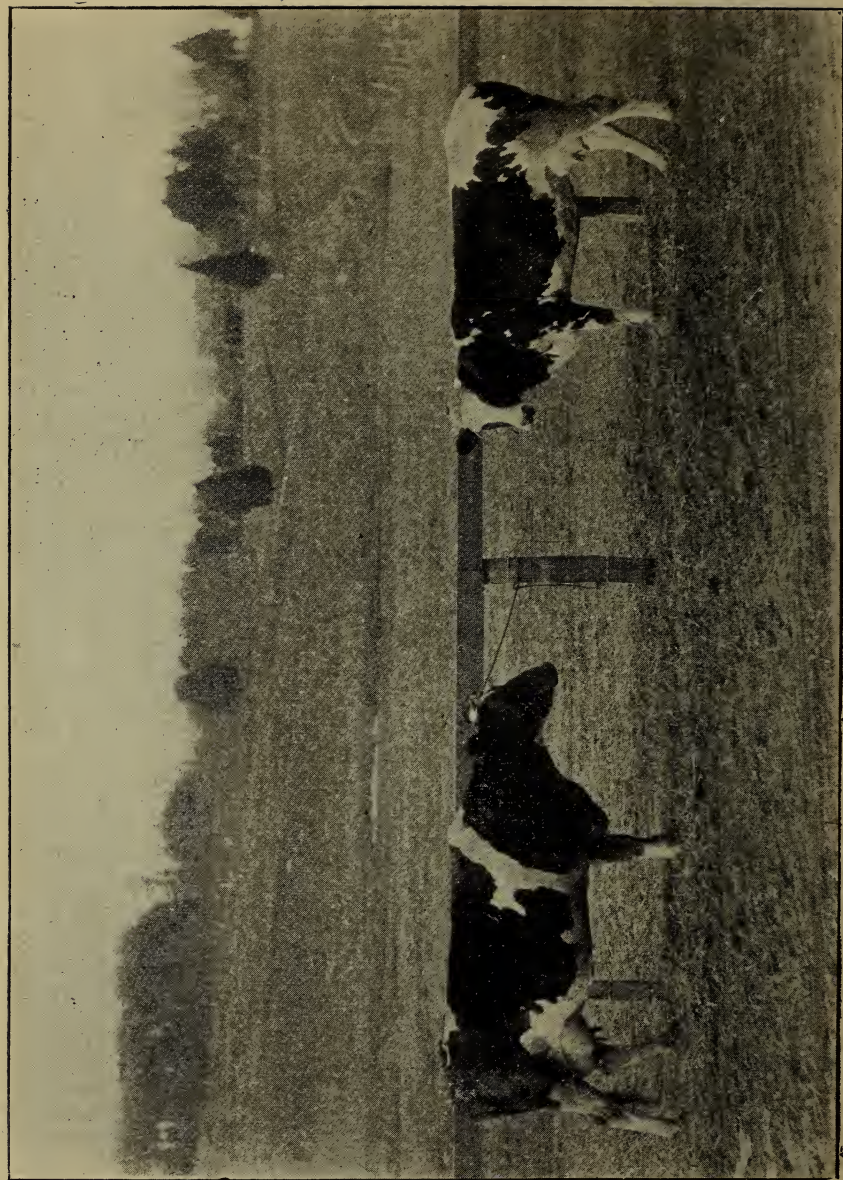
By Prof. H. J. PATTERSON.

Manures (five lectures).—The best methods of preserving and applying farm manure. The relative value of the different manures and fertilizers. The maintenance of soil fertility. The place of lime in the farm economy.

By Dr. H. B. McDONNELL.

Tobacco (six lectures).—The plant bed, culture, harvesting, curing, marketing and effect of fertilizing elements upon the quality.

By Prof. H. J. PATTERSON.



Sweet Cleely 7545 and Mink Artis 29208 of the Holstein Friesian Herd.

II.—DAIRY HUSBANDRY AND DAIRY CHEMISTRY.

In order to give students the opportunity of pursuing the subject of dairying in a practical way and under the latest and most approved methods, arrangements have been made with Director Robert H. Miller for the use of the Experiment Station creamery and creamery appliances.

This outfit consists of a new dairy building, containing a main work-room, a wash-room, an engine-room, a room for deep and shallow setting of milk, a cream ripening room, a refrigerator, a milk testing room, an ice-house and an office. This building is fitted up with the necessary apparatus for practical work and illustrating different systems of dairying.

Ten lectures. Dairying as adapted to different sections of Maryland. Selling of milk, cream, butter and cheese. Summer or winter dairying. Dairy or creamery. Dairy and creamery management. Methods of creaming. Ripening of cream. Churning, working, salting and preparing butter for market. Judging of butter. Preservation of milk and butter-milk. Sterilization. Statistics of products and consumption. The chemistry of milk, butter and cheese. Milk testing.

In addition to the lectures, the various operations will be illustrated in the laboratory and creamery, and each student will be expected to take part in the practical work, and perform and become familiar with each operation.

By Prof. H. J. PATTERSON.

III.—HORTICULTURE.

Fifteen Lectures. Construction and management of greenhouse, hot beds and cold frame-making, cuttings, buddings, grafting, pruning. Cultivating orchards and small fruits. Spraying for insects and fungus diseases. Originating and improving varieties of fruits and vegetables. Cross-fertilization, selection and cultivation. Fruit raising and commercial gardening. Conditions of success as to soil, culture, pruning, propagation, varieties and fertilization. The markets, their requirements and opportunities.

By Prof. J. S. ROBINSON.

IV.—AGRICULTURAL CHEMISTRY.

Five Lectures. Soils: their formation, classification and properties. The mineral constituents of plants and their bearing on plant growth. The best plan of supplementing them when needed for plant growth.

By Dr. H. B. McDONNELL.

V.—PLANT PHYSIOLOGY.

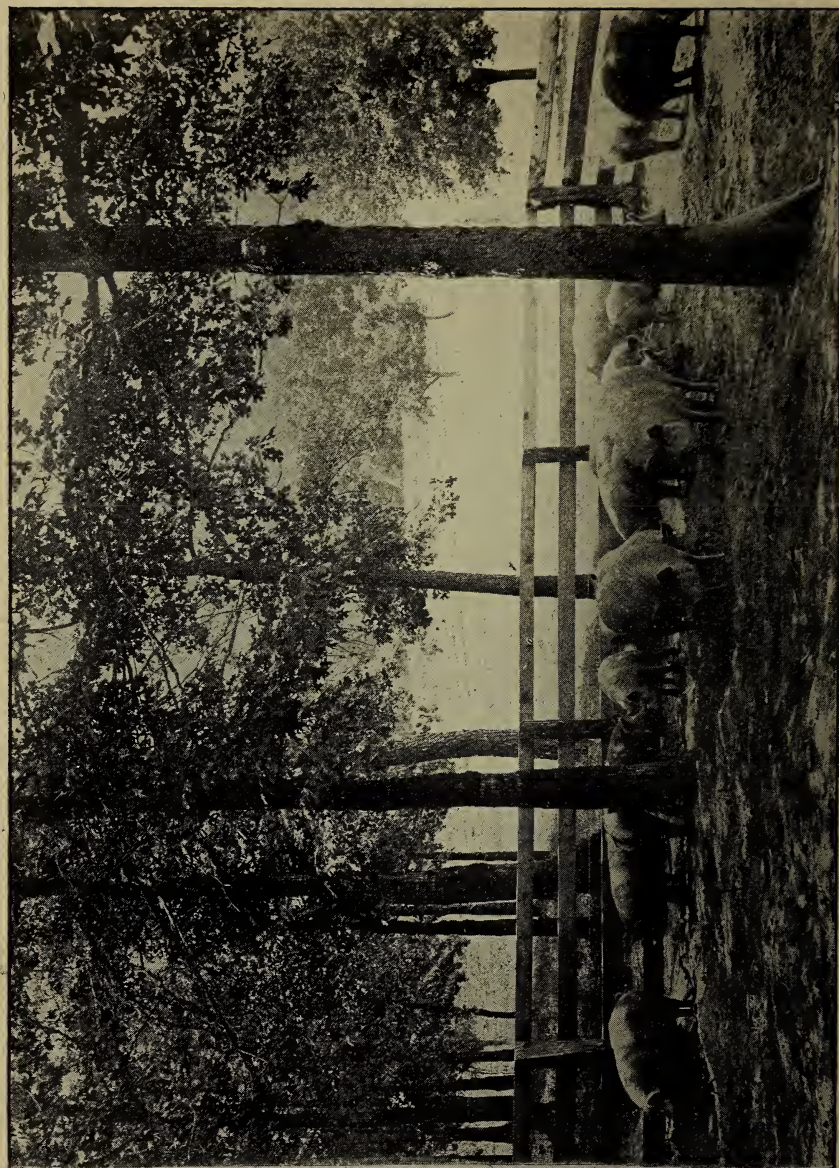
Five Lectures. The life and function of the cell. The absorption of incombustible inorganic matter and its conversion into the body of the plant. Assimilation, conversion, transportation and storage of organic matter. The nature of the energy which lends itself to the performance of this work.

By Dr. M. P. SCOTT.

VI.—SANITARY SCIENCE.

Farm Hygiene: air, water, food, wholesome and injurious to health. Microscopic examination of same. Impurities and adulterations in food. Means of guarding against preventable diseases.

By Dr. M. P. SCOTT.



SMALL YORKSHIRE HERD.

VII.—ECONOMIC ENTOMOLOGY.

Five Lectures. The lectures will treat of those insects injurious to fruit, farm and vegetable crops and animals, their habits and life, and the best methods of exterminating them.

By Dr. M. P. SCOTT.

VIII.—FARM ACCOUNTS.

Six Lectures. The best methods of keeping them. The necessity of this in these times of close competition and small profits.

By Prof. HARRISON.

IX.—FARM BUILDINGS AND ARCHITECTURE—BRIDGE CONSTRUCTION.

Eight Lectures. Designing the various buildings on the farm with special reference to economy and convenience. In this the student will not only design, but calculate the amount and cost of material, and make all specifications necessary for a proper completion of the work.

Bridge work will consist of designs of cheap and durable structures, with a knowledge of all the practical details of the same.

By Prof. H. G. WELTY.

X.—CARPENTRY AND BLACKSMITHING.

Ten exercises of two and one-half hours each. A knowledge of this is very important to the agriculturist of this day. The equipment for this instruction is complete. The industrious, eager seeker after knowledge will accomplish much in the line of this work in the time allotted.

Practical Lessons in Carpentry.—Care and use of tools.

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| 1. Sawing and planing. | 7. Tap splice. |
| 2. End mortise and tenon. | 8. Splayed splice. |
| 3. Half mortise and tenon. | 9. Glue joint. |
| 4. Pin mortise and tenon. | 10. Housed mortise and tenon. |
| 5. Outside mortise and tenon. | 11. Window sash. |
| 6. Key mortise and tenon. | 12. Four-panel door. |

Practical Lessons in Blacksmithing.—Mechanism of, and care of forge and smith's tools. Preparation of forge for fire. Building and managing the fire fluxes. Forging, bending, welding.

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| 1. Eye bolt. | 7. Right-angular bent sheet. |
| 2. Staple. | 8. Knee. |
| 3. Hook. | 9. Chain. |
| 4. Chain links. | 10. Horse shoe. |
| 5. Double eye. | 11. Shrink on a tire. |
| 6. Stirrup. | 12. Welding and tempering. |

By Lieut. J. D. FORD with assistants.

XI.—VETERINARY SCIENCE.

Fifteen Lectures. A study will be made of the anatomy and physiology of the domestic animals. All of the more common troubles, with the proper treatment, will be given. In short, the aim will be to give the attentive student such information as will fit him to combat success-

fully the more common diseases to which domestic animals are subject. During the term it is desired to make a test for tuberculosis in the College herd with Koch's lymph. The students will be required to be present and assist in the test. The course will be conducted by Dr. WARD, State Veterinarian.

XII.—CITIZENSHIP.

Ten Lectures. Fundamental principles of our government. The State and the Nation. Local government in Maryland. Taxation and land values. The State and education. Representation. Elections and election laws. Farm deeds and mortgages. Contracts and sales. Legislation in its relation to the farmer.

The object of this course will be to prepare the student for the active duties of citizenship and to show him the best and safest course for him to pursue for the preservation of his individual interests and those of his community. Any special course, such as above outlined, would be incomplete without some instruction in this important subject.

By Prof. R. H. ALVEY.

SPECIAL LECTURES ON IMPORTANT TOPICS.

We are negotiating for a series of lectures by Professor WHITNEY, on Soil Analyses, assisted by SOTHORON KEY, B. S.

EXPENSES FOR THE COURSE.

Only a nominal charge of five dollars (\$5) will be made for the course. Students will be expected to board in the neighborhood. Good board can be secured for \$4 per week. The entire expenses for the course of six weeks, including traveling expenses, should not be over \$50.00.

CHEMICAL DEPARTMENT.

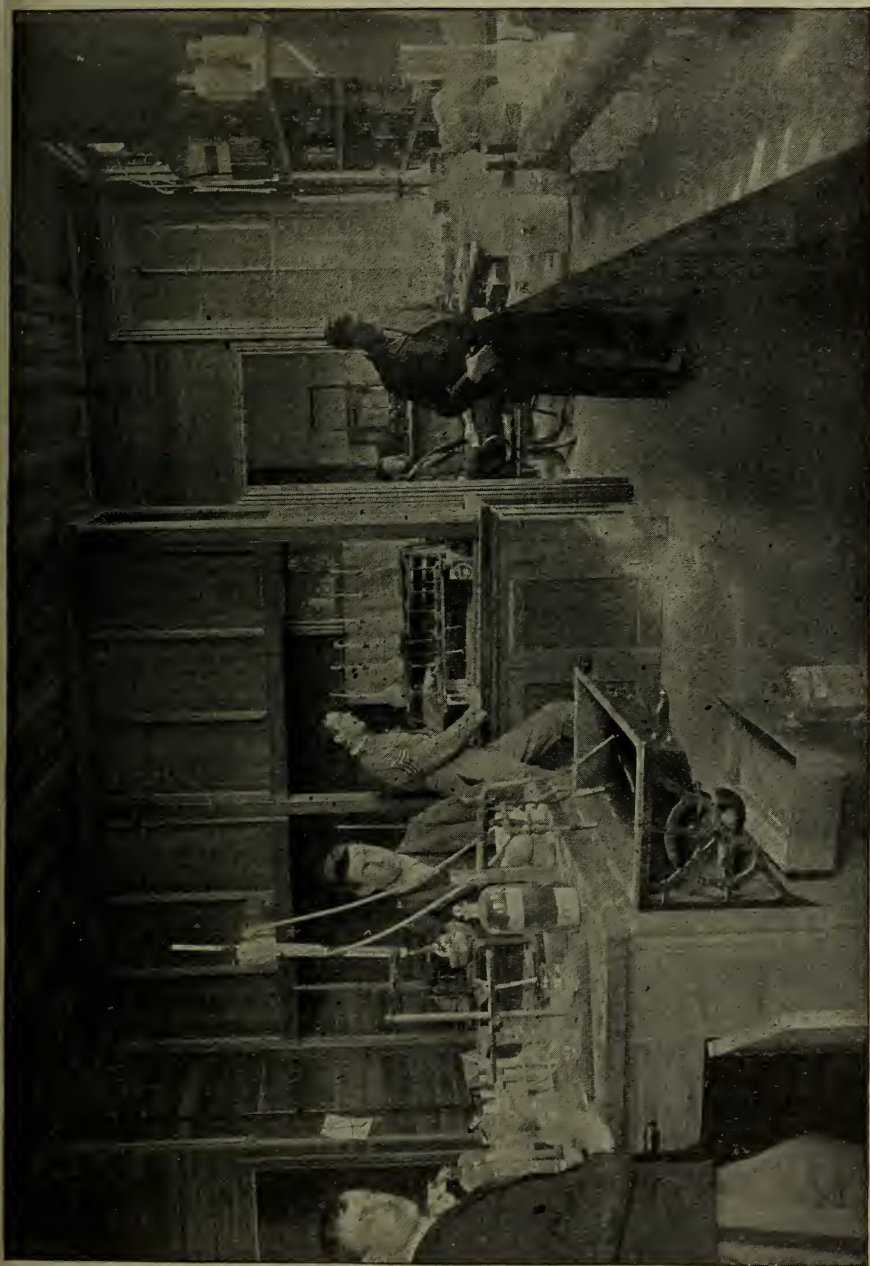
Prof. H. B. McDonnell.

TO THE PRESIDENT:—

On taking charge of the Chemical Department, September 1st, 1892, the prospect for practical results was discouraging. I found the available appropriation to be very small—something like \$200—and this was to supply material for lecture experiments, material for three classes in the laboratory, material for analyzing fertilizers and funds for collecting samples for the same. I had been allowed an assistant, who was a member of the Senior Class, who had had no experience whatever in quantitative chemical analysis, and whose regular class work took practically all his time; his usual hour for reporting for work being 4.30 P. M. Thus equipped, brilliant results could not be expected.

At the beginning of the year the heating apparatus was remodeled, the boiler being removed to the basement, and the heating coils from the ceiling to the floors.

In regard to the instruction given that year I will only note that the Sophomore Class was given laboratory work, in connection with their



CHEMICAL LABORATORY.—FERTILIZER DEPARTMENT.—Students at Work.

work in general Chemistry, something that had not been attempted before.

There were at least 1,200 brands of fertilizers for sale in the State at that time, many of them badly in need of inspection. I succeeded in analyzing 80 samples, and also a number of miscellaneous samples of water, minerals, etc.

For the year '93-4, Mr. Sherman, then a graduate of the College, was continued as assistant, and was now able to do excellent service. The appropriation for supplies, sampling fertilizers, etc., was about four times as much as was available the previous year. The present lecture room was finished, and the general laboratory was fitted with lockers, the latter being very desirable, especially when two or three classes work in the same laboratory. For the first time most of the laboratory supplies were imported, duty free, from Europe, the saving thereby on the cost of the glassware being at least 60 per cent. This practice is still continued.

This year, '93-4, a special effort was made to analyze as many fertilizers as possible, in order to awaken some interest throughout the State in the importance of the work. Nearly 200 analyses were completed and published during the session of the Legislature, and attention was drawn to the fact that the fertilizer law was not effective.

Nearly 200 more fertilizers were analyzed in the spring, and a second assistant was added to the force, in the person of Mr. Veitch, who had previously been connected with this work.

At the beginning of the present year—'95-6—the apparatus and supplies were put in charge of Mr. C. C. McDonnell, of the Class of '95, and they are given out to students on written orders. This arrangement will effect a great saving in supplies, and leaves the time of the instructor free for teaching, instead of keeping him running to the supply room.

The work of fertilizer analysis has probably reached a maximum this fall. Five hundred and fifty samples have been received—thirty of them being from farmers—the balance being collected by us. Nearly 500 of these will be analyzed. Our rule is to make all analyses in duplicate. In cases where a protest is expected, they are sometimes made oftener. When it is remembered that the analysis of a single fertilizer is a tedious process, including between thirty and forty weighings on a delicate balance, accurate to within 1-5,000,000 of a pound (one milligram), and a number of tedious calculations, and that a part of the record of each fertilizer is to be found in eight or ten books, some conception can be formed of the amount of work involved. Even after the analyses are made, the work of arranging them alphabetically in tables and afterwards examining and correcting the proof sheets is considerable. A report of each analysis is sent to the manufacturer before the same is published, and re-examination made in case of protest. The number of official analyses made is as follows:

Session of 1892-93.....	80 samples
“ “ 1893-94.....	370 samples
“ “ 1894-95.....	744 samples
Fall of 1895.....	500 samples (not completed)

The value of this fertilizer analysis to the farmers it is impossible to estimate accurately, but I feel safe in saying that it saves them hundreds of thousands of dollars each year.

I desire to compliment the efficient work of my Assistants, Messrs. Veitch, Bomberger, Skinner and McDonnell. The force is sufficient for the present needs of the Department. A janitor is needed, however, to give his entire attention to the laboratory, to sweep floors, clean sinks, wash dishes, etc.

In addition to the regular work of the Department, considerable time is required each year in testing new methods for the analysis of fertilizers. In this we co-operate with other members of the Association of Official Agricultural Chemists. I attend the meetings of this Association every year as the representative of the College, and assist in the adoption of the official methods for fertilizer analysis in the United States.

The College maintains several courses of study which emphasize special lines, such as the Classical, Agricultural and Mechanical. Why not have a Chemical Course, in which provision is made for teaching advanced Chemistry during the Junior and Senior Years? This would obviate the trouble experienced at present by some of the students desiring to put in extra time in chemistry, for which neither they nor myself get proper credit.

I regard the subject of Mineralogy an important one for students of science, agriculture and chemistry, to enable them to recognize at sight, or after a simple test, the common minerals and ores, and I think that a short course in this branch—mostly laboratory instruction—could be profitable given in the Chemical Department during one term of the Junior year. The time required would be four hours per week, divided into two periods.

RECOMMENDATIONS.

1. That a new chemical laboratory be built according to the plans prepared by Lieutenant Ford and myself. The cost would hardly equal the amount earned in one year by the Chemical Department by the analysis of fertilizers.

2. That a Chemistry course be provided, similar to the Agricultural, Classical and Mechanical courses.

3. That Mineralogy be taught during one term of the Junior year to the students of the Agricultural, Scientific and Chemistry courses.

Respectfully submitted,

H. B. McDONNELL,

Professor of Chemistry.

DEPARTMENT OF MILITARY SCIENCE.

TO THE PRESIDENT:—

I have the honor to make the following report:

For Military instruction the cadets are organized into an Infantry Battalion, the organization of which is given elsewhere in this report.

Since September 20th, the cadets have drilled six times a week in the school of the soldier, squad and company. They have marched to all duties in military formation, guard has been mounted daily and instructions as sentinel and officer of the day carefully given. As soon as winter permits, the school of the battalion, battle exercises, minor tactics and target practice will be taken up.

The success of past years in small arms practice warrants a more extended instruction this year. A range equipment is badly needed. A suitable and safe range can be constructed for \$500. I hope this allotment will not be longer delayed.

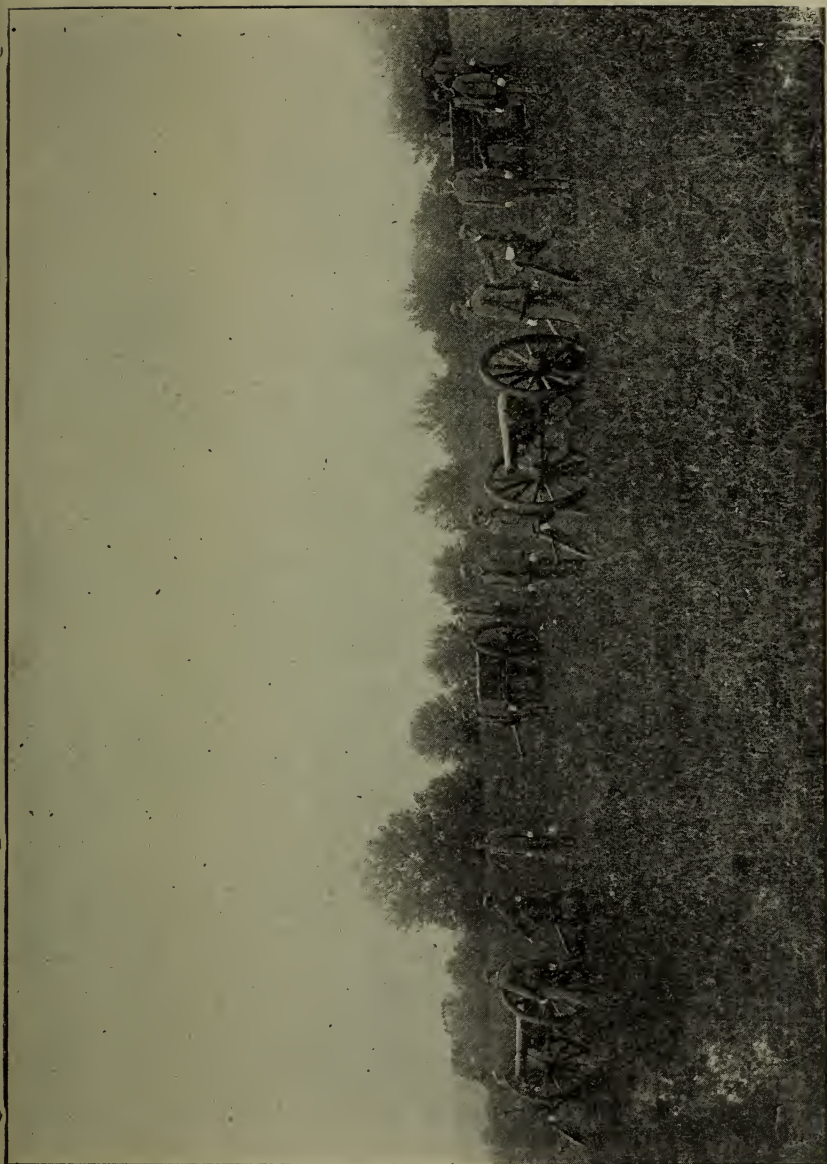
Before the close of the term, I recommend that the cadets be placed in camp for a few weeks, and that their work then be practical work in the several departments. This will permit instruction in field duties, advance and rear guards, marches and competitive contests. I hope the State authorities will all allow the College to use its camp equipage for this purpose. Forty-four A tents, 16 wall tents, and two hospital wall tents and flys, or forty-nine wall tents and two hospital tents will be adequate for a complete camp.

Since September 20th, the Senior and Junior classes have completed drill regulations, and Freshman and Sophomore classes as far as the school of the soldier.

All classes have been instructed in records; company morning reports, battalion report, monthly report, sick report and rosters have been kept daily. This should be supplemented by a complete set of records pertaining to a Company and Regiment of the State National Guard, as well as the Administration Department records and the reports to the State Adjutant General, from whom it is hoped a complete set of the blanks and blank record books can be obtained. The War Department does not furnish these to Military Colleges, and I am glad of it, as the system of records and reports is too elaborate for field service.

Minor tactics, field engineering, campaigns and army regulations will soon be taken up by text and lectures. The practical procedure of court-martial, and a brief course in military law will be given if time permits. Since the strikes of 1894, the War Department has made quite plain the hitherto vague duties of officers called to suppress them. These are published in the new Army Regulations. The students should be instructed in the duties of the National Guard during riots.

I have not been able to get from the State a manual defining the relation of the Military to the Civil Authority. It is hoped that the Adjutant General will have one prepared.



ARTILLERY DRILL.

From the Report of the Inspector General, United States Army, for the year 1895, to the Secretary of War, I extract the following :

"The military organizations of seven Colleges form part of the National Guard of their respective States, and at another College the State Code provides for the organization, though it is not part of the State Guard. In some other States the Governors have been authorized by law to confer brevet-commissions upon graduates from the military departments. The following is a copy of a recent State law that may be worthy of emulation :

An Act in relation to the College Cadets of Colorado Agricultural College, and to repeal all laws in conflict therewith.

Be it enacted by the General Assembly of the State of Colorado :

SECTION 1. That for the purpose of further carrying out the provisions of the Act of Congress approved July 2nd, 1862, in relation to Agricultural Colleges, the military body known as the Agricultural College Cadets of the Colorado Agricultural College, is hereby organized as an auxiliary branch of the Colorado National Guard, placed upon the same footing as regards arms, ammunition, clothing, camp and garrison equipage, as the Colorado National Guard.

SEC. 2. The proper officers of said Colorado National Guard are hereby authorized and directed to honor the requisitions of the commanding officer of said Agricultural College Cadets, under such rules and regulations as may hereafter be prescribed by the State Military Board, and the State Board of Agriculture, when countersigned by the President of said College for the amount of ten rounds of ammunition per year for each member of said military body, and for such camp and garrison equipage as may be necessary for the proper instruction of said body in all that pertains to the practical duties of soldiers in camp.

SEC. 3. The Cadets of the State Agricultural College shall be attached to the Colorado National Guard under such rules and regulations as may hereafter be prescribed by the State Military Board and the State Board of Agriculture.

Approved April 9th, 1895.

The touch of elbow between these Cadet Organizations and the National Guard is already established, as evidenced by these beneficial laws and the substantial aid some twenty or more Colleges have received from their State Governments, and any further assistance the General Government can give these institutions is a safe and wise investment.

The wish of the Federal Government is plain. I hope our State Legislators will frame an Act in the direction here indicated. If special favors are to be given States who enter into the spirit of military instruction, we ought to be in a position to claim them. Many States meet the Federal Government more than half way. Maryland gives very little assistance to the Military Department of her College.

This school has no armory for drill or gallery practice. Winter instruction is limited to a cramped manual drill in dark hall and a basement, and one of the section rooms of the College is the only store-

room for arms and ammunition. It is not safe to store ammunition in a dwelling or dormitory building.

The young men who choose military education at the State Military School deserve recognition and assistance as part of the soldiery of the State. Their intelligent interest in the study of war warrants it. This school can furnish in its graduates most valuable material for the personnel of the National Guard. Let those who doubt look up the civil war records of the Virginia Military Institute. Her soldiers contended with West Point for the honors of the battle-field. There is no reason why we should not build up the Military Department similar to the Virginia Military Institute here.

The students should have an opportunity to attend the National Guard encampment, and study brigade movements and learn on the field what we try to study here on the black board.

I hope that in the present year a target contest and competition drill can be arranged with some of the battalions of the National Guard and the Cadet Corps of St. John's College. Last year our target team competed with the National Guard of the District of Columbia. This year the team should be from the State.

Respectfully submitted,

CLOUGH OVERTON,
1st Lieut. 1st U. S. Cavalry.

Prof. of Military Science.

DEPARTMENT OF NATURAL HISTORY.

Prof. Martin P. Scott, M. D.

Natural History is one of the most important and extensive of the sciences; there is none of more practical value. There are few relations of life into which it does not enter to some extent, and in many a greater or less knowledge of it is indispensable.

As a means, also, of practical intellectual cultivation it yields to none, because, treating as it does of the natural objects which surround us and enter into our daily life, it develops at the same time, and in an eminent degree, the faculties of observation, memory and reason.

The following outlines illustrate the course and methods of study:

The Class in Physical Geography studies the surface of the earth, its waters and its enveloping atmosphere; the terrestrial machinery, and the physical forces by means of which the earth is fitted for the abodes of its fauna and flora. The Text-book is Maury's Physical Geography.

In Geology the instruction embraces the action of those forces which have shaped the earth, and which are constantly at this time at work. It gives also an account of the succession of events on the earth's surface, together with the history of organic life which characterized the four grand divisions of the earth's history and their sub-divisions. A cabinet of minerals illustrates that part which treats of crystalline rocks. The Text-book is Shaler's First Book of Geology.

In Human Physiology the class investigates the functions of the organs of the human body and how their actions are brought about. As much Anatomy is taught by plates and models as is necessary to understand the working of the machine during life. The Text-book is Huxley's Elements of Physiology.

The work in Zoology embraces comparative anatomy and physiology, distribution of animals, systematic Zoology and Taxonomy. Our aim is to present clearly the established facts and principles of Zoology. The method of teaching is by text-book, recitations and lectures, as no text-book can supersede oral instruction. As much time as possible is devoted to practical work. The text-book is Orton's Comparative Zoology.

In Biology we have two objects in view—to teach Biology as a part of a liberal education and to treat it as a part of the Agricultural course of the College; for it may be said in a large degree agriculture is biology applied, its various branches treating of the phenomena manifested by living plants and animals. The types selected from the vegetable and animal kingdoms are designed to illustrate the chief modifications of structure and physiological processes. As much time as possible is devoted to practical work.

DEPARTMENT OF APPLIED MATHEMATICS.

Prof. H. G. Welty.

The special studies of this department comprise surveying, descriptive geometry, land and house drainage, sewerage water supply, general engineering construction, strength of materials, designing of roofs and bridges and simple architectural structures. The work covers a course of three years, beginning in the Sophomore year.

The work in surveying embraces ordinary land surveying, leveling, triangulation, topography, railroad location, profiles, maps and estimates. An equipment of engineering instruments affords the students the opportunity of becoming familiar with their construction and uses by frequent practice in the field. Much time is devoted to practice, both in the field and in a commodious drawing-room equipped for this special department. Each student is required to acquit himself proficiently in the use of instruments, in taking field notes and in map drawing. Particular attention is paid to the execution of topographical surveys and maps by the best modern methods. Railroad maps and profiles are made from actual field location, from which estimates of cost of construction are calculated.

Descriptive geometry, as taught in this College, includes a short course of lectures in orthographic projection, shades and shadows, linear perspective and isometric drawing, essential to all who have in view any of the technical professions.

Drainage, sewerage and water supply are subjects that appeal to every citizen as important factors in his education. Lectures cover the subject of residence and city water supply, systems of sewerage and disposal of same and the most approved practices of drainage and ventilation of houses. A stream on the premises affords every opportunity of practical measurement of water by weirs and orifices and the testing of hydraulic motors and rams.

General engineering construction, such as foundations, masonry, piling, strength of materials, including wood, stone, cements, iron and steel, is treated in the form of lectures with practical tests. Visits to important works are supplemented by written reports by the students.

The course in roofs and bridges is begun with the theory and practice in the computation of stresses. The student is then given a copy of a specification, and is required to design, make all computations, drawings and bills of materials for a highway bridge. The drawings are made in the manner similar to those made in the drafting-room of a bridge company. In connection with this work, visits of inspection are made to bridges in the vicinity.

House and barn construction receives sufficient treatment to enable the students to prepare specifications, plans and estimates for buildings of moderate cost.

DEPARTMENT OF LANGUAGES.

Prof. Thomas H. Spence.

LATIN.

The course of study in this branch is given with two ends in view : First to train the growing mind into accurate and close methods of reasoning ; second, to give the student a more thorough and comprehensive knowledge of his own language than he might otherwise acquire. These aims are kept constantly before the student, so that he may not pursue the work without motive ; and he is made to realize the value of Latin as a factor in the complete understanding of its resultant tongue, English.

To accomplish the first mentioned aim, accuracy of thought, special attention is given to Latin Syntax and idioms. The study of Syntax is greatly facilitated by work in Latin Prose Composition, and exercises are submitted every week for the first three years for criticism and correction.

After being thoroughly grounded in the forms and a few primary constructions of the language, the student begins reading Sallust's Jugurthine War, during the reading of which he is made to evolve his own rules of syntax from the text. These rules he verifies by reference to some standard grammar ; this constitutes the work of the Freshman year.

The Sophomore year is devoted to Cæsar's Gallic Wars, a portion of Virgil's *Æneid*, Latin Prose Composition, and lectures upon Syntax, Prosody and Greek and Roman Mythology.

In the Junior year Virgil is completed, and also the orations of Cicero, accompanied by Latin Prose Composition and lectures, and the reading at sight of Cornelius Nepos.

In the Senior year the entire course is completed with the reading of Horace and Tacitus, and sight reading from Ovid's *Metamorphoses*.

FRENCH AND GERMAN.

In addition to their value as a factor in the education of every man who has to do with the citizens of France or Germany, a knowledge of these languages appears invaluable when we think of the many books and periodicals devoted to Agriculture and its kindred sciences. These are rarely translated into our language, and an ability to read them readily opens up an avenue to that knowledge, which can be obtained in no other way.

FRENCH.

In this branch the first year's work is devoted to forms, idioms and conversation, with the reading of some elementary work, such as Rougemont's "*La France*." In the second year French journals are read, and some scientific work written in French. A readiness of pronunciation and translation is insisted upon, and reading at sight of easy French forms part of the work.

GERMAN.

On account of the large percentage of Germans in our population a speaking knowledge of this language is very important, and special attention is given to conversation throughout the course. After a short study of the elements the student takes up some easy work, such as Lessing's "Minna von Barnhelm." In the second year the work is concluded with the reading of German journals and scientific matter.

DEPARTMENT OF PHYSICS.

Prof. H. G. Welty.

This important subject is presented in a course of lectures, illustrated with numerous experiments performed before the classes, supplemented by the use of text-books and practical laboratory work on the part of the students.

The course is divided into two parts: Those who are pursuing the Classical course of study devote but one year to the work; all others pursue it three years. The work is begun by all in the Sophomore year. In order that the Classical students may have some acquaintance with all the subjects treated in physics, the first year's work is made complete in itself, being more elementary than the course following during the next two years. The text-book used with class is Gages' Introduction to Physical Science. Two hours per week are devoted to the study, with little attempt at practical work, further than the experiments performed by the instructor and the solution of numerous problems by the student. Special attention is given to the metric system of weights and measures. On the completion of this year's work, those who continue the work are well prepared to take up higher work. The Junior and Senior Classes take up the subject beginning with Dynamics, using Gages' late treatise on Principles of Physics, adopted this year instead of Ganot's Physics.

The Junior class devotes two hours per week to recitations and lectures, and one hour to practical laboratory work, covering all subjects except light and electricity. The Senior class devotes the third year entirely to these named subjects, giving two hours a week to recitations and lectures, and two hours to laboratory work.

The subjects taught are presented within the easy comprehension of the average student, without any attempt to popularize them by use of loose or unscientific language, or misleading illustrations or analogies. Especial care is taken to guard against any methods not in harmony with the most modern conceptions of physical science. In a word, the method of instruction is such as is demanded by the present scientific activity of the age. The past decade has witnessed many rapid strides in scientific discovery. The text-books have of necessity been largely re-written to keep pace with this growth. The subjects of electricity and magnetism have especially outgrown their former apparel.

The department is well equipped with apparatus for general elementary physics, but it is very much in need of special apparatus and appliances for a more advanced course and for laboratory work. It is entirely wanting in current electricity. The purchase of a small dynamo for electrical tests or measurements for electric metallurgy would be advisable. A special room is needed for laboratory work, fitted up with facilities for experimental work, especially in the line of electricity and heat.

I would respectfully request one hour per week to be allotted to the Sophomore class, that they may give some attention to practical laboratory work. The schedule might be so arranged that fewer students would occupy the laboratory at one time. It is impossible for an instructor to give proper attention to so large a number at one time.



MECHANICAL ENGINEERING BUILDING.

MECHANICAL ENGINEERING DEPARTMENT.

JOHN D. FORD, Chief Engineer, U. S. N., Principal.

HARRY GWINNER, Assistant Professor Mechanical Engineering.

TO THE PRESIDENT:—

In compliance with your request, I have the honor to submit the following report of the condition and needs of this department.

The completion of the Mechanical Building and its partial equipment puts the College in condition to offer to the public the commencement of a thoroughly organized Department of Mechanical Engineering. The following outline will give some idea of the scope of the work and what it proposes for the future.

The progress of the students during the year has been satisfactory. Ten members of the Junior class are being instructed in Architectural Drawing; the members of the Sophomore class in Drawing (Mechanical) and machine designs; while the Freshman have Geometrical Drawing and Lettering, including projections and intersections of surfaces and solids. Eleven members of the Freshman class are enthusiastically at work in the Mechanical Engineering class, and are doing most excellent work, while four members of the agricultural section are being instructed in manual training. A well graduated course of lessons has been outlined for the laboratories, and the best results are anticipated.

The pattern-working shop has been fitted up with six double work-benches and tools; five wood-turning lathes and tools; a twenty-six inch band saw; a circular saw, and a grind-stone, with the necessary shafting, pulleys and belting for driving the same. The eight by twelve inch cylinder steam engine that was presented to the College by the Mayor and City Council of Baltimore City, has been set up in place in the machine shop, and is now in condition for driving the entire machinery of the department. This engine was made by the members of the graduating class of 1887 of the Baltimore Manual Training School, and I have no doubt, will be an inspiration for our men to do good work. Benches for vises have been placed in the machine and forge shops, and a double moulding bench has been made for the foundry. The various shops and rooms are being equipped as rapidly as funds will permit.

Nine forges, with the necessary hand tools, anvils and blowing and exhaust fans are required for the forge shops. A small cupola, with fan blower is required for the foundry, and five screw-cutting engine lathes, a three feet six inch by seven feet metal plane, a shaping machine, a drill press and the necessary hand tools will be needed for the equipment of the machine shop. The lecture room on the second floor needs chairs and desk.

The completion of the Mechanical Engineering Building, and its practical equipment puts the College in condition to offer to the public the commencement of a thoroughly organized department of Mechanical Engineering, where the young men of all sections have an opportunity to study the science of mechanics near their homes. The principal subjects studied are the nature, equivalence and analysis of mechanisms, the mechanics, or theory, of the principle classes of types of machinery, mechanical technology and the principles and practice of machine design.

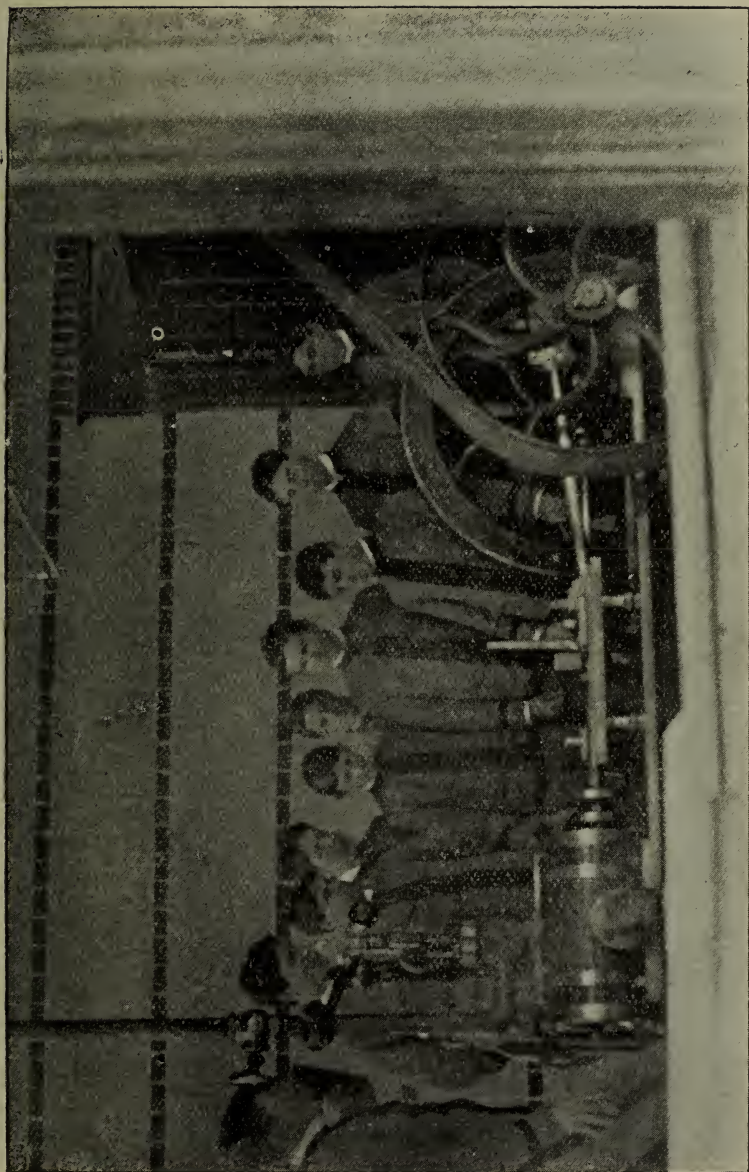
That the students may obtain the practical engineering data which they will most need when beginning their work as mechanical engineers, they are required to pursue a course of shop instruction, which necessarily involves manual labor and manipulation of tools, which is principally devoted to familiarizing them with those points in pattern-making, molding, forging, fitting and finishing, which they need to know as designers of machinery. Particular attention is, therefore, directed to the forms and sizes of machine parts, that can be readily constructed in these various work shops; to the time that it takes to perform and the order of the various operations; to the dimensions most needed by workmen; and to the various devices for increasing the accuracy of the work, durability of the parts, and convenience of manipulation. This involves acquaintance with the processes and machinery of the work shops, but it is the Superintendent's knowledge rather than the manual dexterity and skill of the workman and tool hand.

Mr. H. Gwinner was appointed an assistant in this Department on the first of August, since which time he has been doing good work.

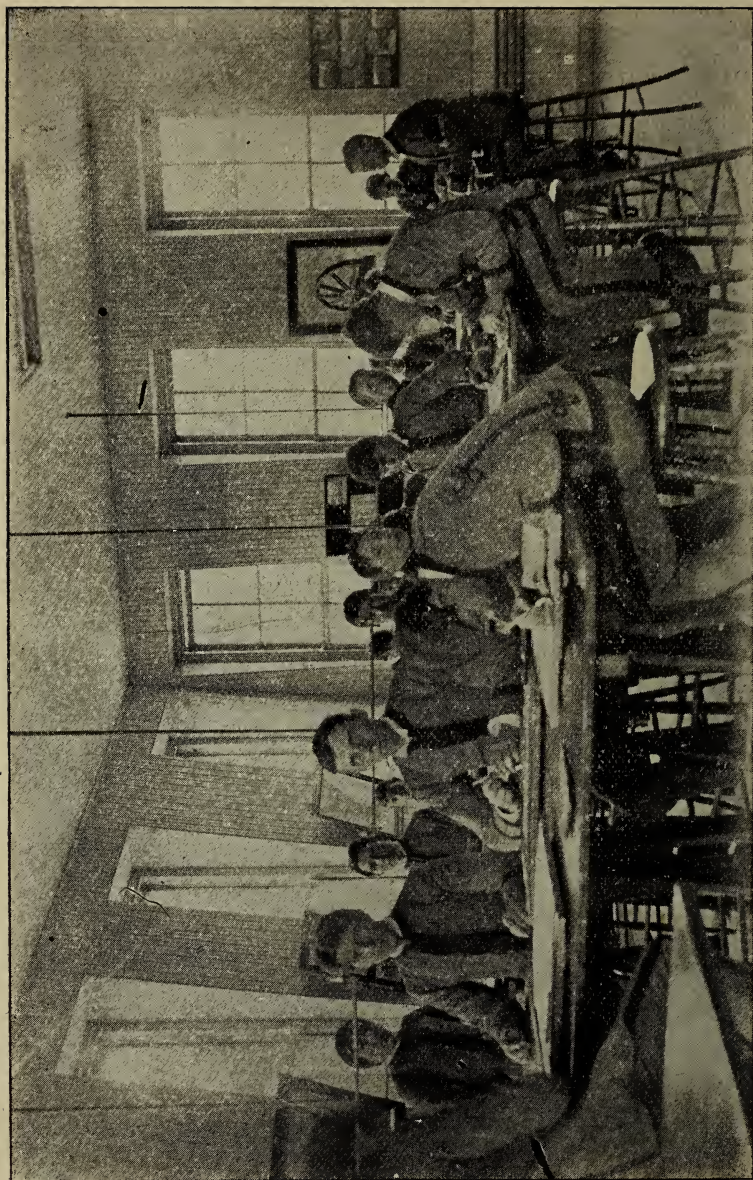
In conclusion, I wish to avail myself of this opportunity to thank the members of the Board of Trustees and yourself for uniform courtesies and support in building up the Department.

Very respectfully,

JOHN D. FORD,
Eng. Corps, U. S. Navy.



CLASS IN MECHANICAL ENGINEERING, THE ENGINE PRESENTED BY THE CITY OF BALTIMORE.



DRAWING ROOM MECHANICAL ENGINEERING DEPARTMENT.

Schedule of the Course in Mechanical Engineering.

FRESHMAN YEAR.

First Term.

Solid Geometry.
Algebra.
General Chemistry.
Chemical Laboratory.
Rhetoric and English Composition.
French (or German.)
Mechanical Drawing.
Freehand Drawing.
Carpentry.
Military Drill.

Second Term.

Plane and Spherical Trigonometry.
General Chemistry.
Chemical Laboratory.
History.
French (or German.)
Mechanical Drawing and Descriptive Geometry.
Freehand Drawing.
Wood-turning.
Military Drill.

SOPHOMORE YEAR.

First Term.

Principles of Mechanism.
Drawing.
Pattern-making.
Analytical Geometry.
Descriptive Geometry.
Physics.
English Literature.
American History.
German.
Military Drill.

Second Term.

Mechanicism: Machinery, Machine Tools, Gear Teeth.
Drawing.
Pattern-work and Moulding.
Differential Calculus.
Physics.
English Literature and Composition.
German.
Military Drill.

JUNIOR YEAR.

First Term.

Steam Engineering, Valve Gears.
Thermo-dynamics.
Drawing.
Forging.
Integral Calculus.
General Statics.
Physics, Heat.
Physical Laboratory.
German.
Military Drill.

Second Term.

Steam Engineering, Boilers,
Drawing, Design and use of Surveying Instruments.
Engineering Laboratory.
Chipping and Filing.
Strength of Materials, Kinematics and Dynamics.
Physical Laboratory.
English Composition.
Specifications of Machines.
German.
Military Drill.

SENIOR YEAR.

First Term.

Steam Engineering.
Hydraulics.
Dynamics of Machines.
Machine Design.
Engineering Laboratory.
Machine-shop Work.
Strength of Materials, Friction.
Metallurgy of Iron.
Heating and Ventilation.
Elements of Dynamo Machinery.
Locomotive Construction.

Second Term.

Hydraulic Motors.
Engineering Laboratory.
Machine-shop Work.
Strength and Stability of Structures, Theory of Elasticity.
English Composition.
Drawing up Contracts.
Iron and Steel Shipbuilding, Marine Engineering.
Thesis.

In undertaking the course in Mechanical Engineering it should be borne in mind that of the subjects studied in the first and second years those most vital to success are Mathematics, Physics and Drawing (including Descriptive Geometry.) All the later professional work of the department is so completely dependent upon these branches that no student can expect to succeed in it without having mastered them.

The professional work of the course in Mechanical Engineering may be classified as follows:

(a.) Mathematics, Physics, and applied Mechanics, given outside the department, the last including the study of and practice in testing the strength of materials.

(b.) Class-room work of the department proper.

(c.) Drawing.

(d.) Engineering Laboratory-work.

(e.) Shop-work.

(f.) Visits to engineering works and manufacturing establishments.

The work of the first year is mainly introductory.

In the second year the more essential subjects given outside the department are Analytical Geometry, Differential Calculus, and Physics. The department gives a course in the principles of mechanism and in the construction of gear teeth, followed by courses on the mechanism of machine tools and of machinery. In intimate connection with this, practice is given in making working drawings of parts of machinery from measurements and other drawings illustrating the class-room work. Instruction is also given in pattern-making and molding at the shops.

The more important third year subjects are:

(a.) Integral Calculus.

(b.) Physics, including a special study of heat and work in the physical laboratory.

(c.) Applied Mechanics, devoted mainly to a mathematical study of the strength of materials.

(d.) Valve gears.

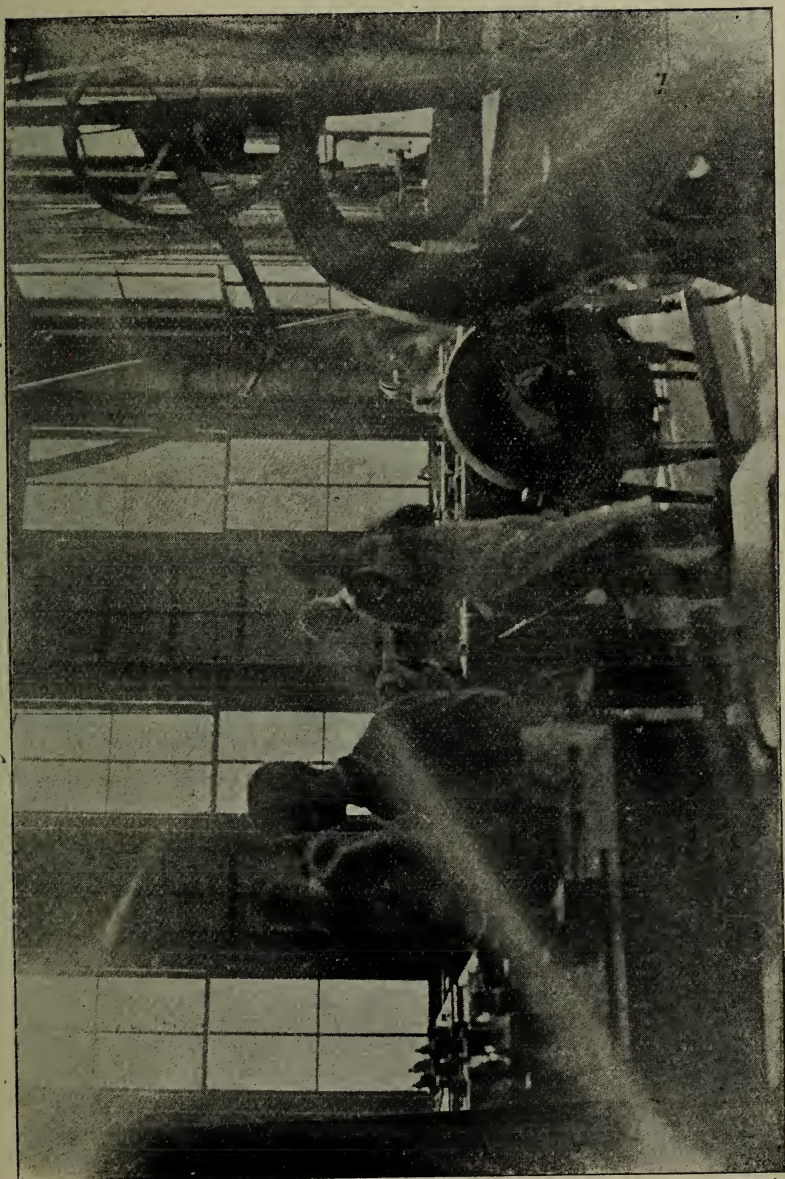
(e.) Thermo-dynamics and Steam Engineering.—This course includes a detailed study of the principles of Thermo-dynamics; a discussion of the properties of gases and vapors, especially steam; of the flow of steam and other fluids of the steam-injector and the hot-air engine. This followed by a study of the steam-engine, of the compound and multiple-expansion engine, and of the method of testing steam-engines and the study of steam-boilers.

(f.) Drawing.—The course for the first term includes detail drawings from measurement of some machine, and assembly drawings made from these detail drawings. In the second term it is devoted to boiler-drawing and the working out of the valve gears and mechanism designs.

(g.) Engineering Laboratory-work.—This is given during the second term, and is devoted to exercises in steam engine and boiler tests, for which the engine and boilers of the department are used.

(h.) Shop-work.—The shop-work of the third year includes forge-work and chipping and filing.

The fourth year subjects are:



PATTERN MAKING LABORATORY. MECHANICAL ENGINEERING DEPARTMENT.

(a.) Applied Mechanics.—The work in this subject aims to familiarize the students with such data on the strength of materials used in construction as have been obtained by means of experiments, especially those made on a practical scale, in different parts of the world. This is followed by a study of friction and lubrication, of girders, stone and iron arches, and of the theory of elasticity.

(b.) Steam Engineering.—A careful study is made of such data as have been based on reliable tests made on large, single, compound and multiple-expansion engines. The gas engine, air-compressors, and refrigerating machines are also studied.

(c.) Machine Design.—Each student is required to make a certain number of designs, as the design of a set of hangers, the design of a boiler, of a shaft with gears and pulleys, and he is required to make all the calculations and drawings necessary for every detail, determining the strength of every part by means of the principles already learned.

(d.) Hydraulics and Hydraulic Motors.—The main principles of hydraulics are taught, including the flow of water through orifices and pipes and over weirs.

(e.) Industrial Management.—This involves a study of the organization and relations of the various departments of an industrial establishment, both in the office and in the workshop, the conduct of accounts, the methods of compensating labor and of superintendence, and the effect upon cost of production, of interest, and other forms of expense.

(f.) Engineering Laboratory-work.—Testing the efficiency of the boilers, engines, pumps, and other apparatus of the department.

(g.) Heating and Ventilation.—(A short course.)

(h.) Metallurgy.—(A short course.)

(i.) Dynamo-electrical Machinery.—(A short course.)

(l.) Shop-work.—Machine-shop work.

(m.) Locomotive Construction and Management.—(A short course.)

(n.) Iron and Steel Shipbuilding.—(A short course.)

(o.) The Thesis.—The thesis required of every candidate for graduation involves the investigation of an assigned problem.

HORTICULTURAL DEPARTMENT.

Prof. Jas. S. Robinson.

In this day of advanced and advancing agricultural work, a knowledge of plant life is essential to the successful prosecution of all divisions of the agriculturalist's labors. This general statement of fact is especially significant when the changed conditions and sharpness of competition so reduce the question of profit along the lines of staple agriculture as to turn the attention to the more profitable expectations of the orchard and commercial garden. A knowledge of the special requirements of varieties, location, soil culture, propagation, market demands, fertilization, pollination, and technical skill are the opportunities for success in this industrial endeavor.

Fine fruits are the flower of Nature's choicest commodities. The market demand is large and constantly increasing. The measurement of profit is most frequently dependent upon the quality of the offerings. A knowledge of the use and opportunity of the hot bed and cold frame is a necessity to the commercial gardener, while on a smaller and comparatively inexpensive scale it may add much to the pleasure and enjoyment of the country home. The winter forcing of vegetables is an inviting field for profit. The experiments on this line at the College last winter were successful and gratifying, not only as object lessons to the students as to the possibilities for profit, but at the same time for the pleasure afforded in their abundant use as a part of our winter bill of fare. The want of means has hitherto prevented an equipment at the College of proper green-house facilities. Such provision is especially desirable. The opportunity for their profitable employment in the State is evidenced by their increasing multiplication, and the demand for their products is attracting more and more attention every year. To compass the requirements indicated, the outline of a course of study is given below. A close adherence to the same will well equip a student for the intelligent prosecution of this line of work.

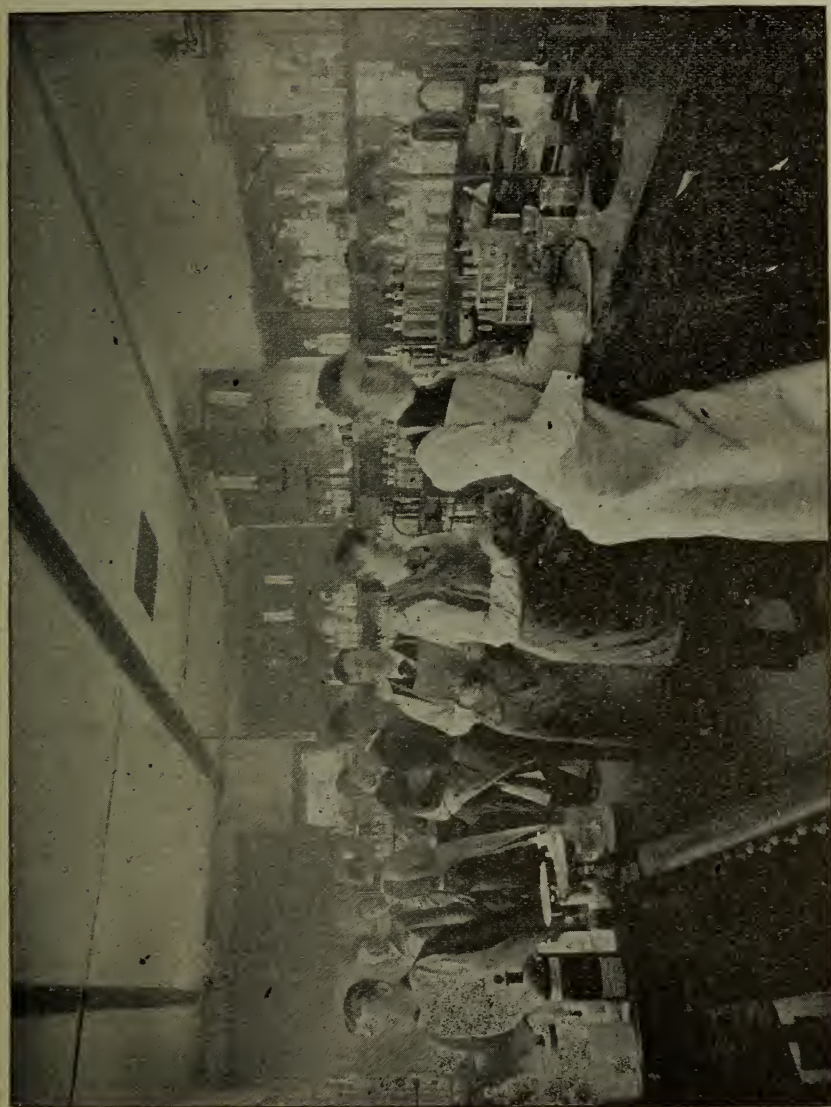
Senior Class—Lectures on Histological, Systematic and Economic Botany, Primary and Secondary effects of Pollination, Cultivation and handling of fruits for market.

Junior Class—Practical and Recitative work, lectures on Systematic and Physiological Botany, Fungicides and Insecticides.

Sophomore Class—Practical and Recitative work, Use of Microscope, Theory and Practice of Budding and Multiplication of Varieties.

Freshman Class—Practical and Recitative work, Use of Microscope, Structural and Systematic Botany, Cultivation of fruits and vegetables, Use of hot beds and cold frames, Management of hot-houses.

Preparatory Class—Lectures on Systematic Botany, Cultivation of fruits and vegetables, Use of hot beds and cold frames.



CHEMICAL LABORATORY.—GENERAL CHEMISTRY.—Senior Class at Work.

PREPARATORY DEPARTMENT.

Prof. H. T. Harrison.

In order to afford facilities for instruction to students of sufficient years, but who are imperfectly prepared for the Freshman class, the Preparatory Department was inaugurated in 1892, and from its inception the patronage it has received has proven the wisdom of the plan.

The students of this department are instructed in military tactics, and have the same attention and accommodations as those of the regular classes. Their study is supervised each evening by an instructor, and they are required to retire earlier; however, a longer period of recreation is allowed, and a greater amount of out-door exercise is insisted upon than among regular students.

A two years' course has been elaborated, and such students as have made satisfactory progress in the primary principles of English, Arithmetic and Geography, and can write a legible hand, are admitted to the department distinguished as class B.

For entrance to the higher grade, or class A, proficiency in the following branches is required: Arithmetic, as far as percentage; Geography, completed; History, outline of United States; Orthography; Technical Grammar and ability to write a creditable essay; Penmanship.

The course of study in this department is directed with a view to furnish the College student with a thorough drill in the elementary and fundamental principles which underlie the Collegiate course so that he may not be hampered by any deficiency which causes so much embarrassment to the poorly prepared College student.

Individual attention is given to each student, and he is taught the art of studying in such a way that he acquires knowledge with greater ease, and hence with far more zeal than the student of crude and undrilled mind. After he has satisfactorily completed the branches required in class A, he is admitted to the Freshman class of the College without further examination.

The following two sets of examinations are given as illustrations of what is required for entrance to the Preparatory Department and to the Freshman class, respectively :

FOR ENTRANCE TO THE PREPARATORY DEPARTMENT.

GEOGRAPHY.

1. Name the countries of North America. What kind of Government predominates here?
2. Give the chief products of the following sections of the United States; the Gulf States, the Pacific States, the Lake States.
3. By what people were nearly all of the South American States settled?
4. Name three cities or countries noted for the export of coffee. Two for tea. Two for silks.
5. Where are the British Isles? Name the divisions of them.
6. Where is Cuba? Give its principal products.

AGRICULTURAL DEPARTMENT,
MARYLAND AGRICULTURAL COLLEGE,
COLLEGE PARK, MD.

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ADMISSION TO FRESHMAN CLASS.

The following examination is that given to the Preparatory class at the end of the year, upon satisfactorily passing which, they were admitted to the Freshman class of the College. All applicants for the Freshman class will be subjected to a similar examination.

Mr. Wm. F. Fyfe
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ARITHMETIC.

1. A, B and C agreed to pay a debt. A paid one-seventh of it, B paid three-eighths, and C paid \$560. Find the amount each paid, and also the amount of the whole debt.

2. A house is worth \$3,800 and $\frac{12}{19}$ of value of house equals $\frac{3}{4}$ of value of a certain farm. Find value of farm.

3. Find proceeds of 18 bushels, 3 pecks, 1 pint of berries sold at 4 cents per pint.

4. How many times will a carriage wheel 3 feet in diameter revolve in going $2\frac{1}{2}$ miles?

5. $\frac{3}{4}$ of 7-18.

Simplify _____.

3-5

.6

6. Simplify $(\frac{3}{4} \times 2\frac{1}{2} \times 3\frac{3}{4}) \div (9\frac{1}{2} \times 25 \times 3-7)$.

7. On cigars sold at \$7 per hundred, there was a loss of 3-17 of cost. Find the cost.

ENGLISH.

1. Write a short letter to any friend, stating what line of work you purpose to follow through life.

2. Write a short sketch of any good book, using your own language.

3. What is the use of parts of speech? Give examples of each.

4. Analyze the following: "His paper was such a good one that he deserved great praise."

5. Distinguish between boys' and boy's; dying and dyeing; rein and reign; pair and pear.

HISTORY.

1. What different nations settled in what is now the United States?

2. Name five Presidents whose administrations were particularly important. What is Congress?

3. What two foreign wars have we had since the Revolution?

4. Name six prominent statesmen since Washington. Six great Generals.

5. Who is now President? To what party does he belong? When elected?

EXAMINATION QUESTIONS OF A PREPARATORY CLASS FOR ADMISSION TO FRESHMAN CLASS.

The following examination is that given to the Preparatory class at the end of the year, upon satisfactorily passing which, they were admitted to the Freshman class of the College. All applicants for the Freshman class will be subjected to a similar examination.

A previous knowledge of Latin is not made an essential for admission to the Freshman class, although for obvious reasons such knowledge is desirable :

ARITHMETIC.

- (1.) Divide the sum of 10.1010 and .0999 by their difference.

2-11 of 12 6-7

- (2.) Simplify $\frac{2-11 \text{ of } 12 \ 6-7}{3-8 \text{ of } 5-6}$.

(3.) By selling cigars at \$7 per C., 3-11 of their cost is gained. Find selling price when gain equals 3-5 of cost.

(4.) The cost of 50 gallons molasses was \$25. One-fifth of it leaked away, and 20 gallons were sold at 62½ cents. For how much per gallon must the remainder be sold to gain \$5 on the whole?

(5.) An expressman engaged to carry 100 vases on condition that he was to receive 25 cents for every one delivered safely, and forfeit \$1.25 for every one broken. He received \$16. How many did he break?

(6.) Divide 200 miles, 56 rods, 3 yards, 2 feet, by 121.

(7.) How many yards of carpet, $\frac{3}{4}$ of a yard wide, will be required for a room 36 feet long and 27 feet wide? Find cost of carpet at \$2.50 per yard.

(8.) Find the cost of plastering the walls and ceiling of a room 36 feet long, 27 feet wide and 18 feet high, at 25 cents per square yard, allowing 45 square yards for door, etc.

(9.) How many bricks, 8x4x2 inches will be required for the walls of a house 60 feet long, 40 feet wide and 15 feet high, if the walls are 3 feet thick?

(10.) How many barrels will a tank hold 30 feet 3 inches long, 16 feet wide and 6 feet 4 inches high?

(11.) Find the time in Calcutta ($88^{\circ}27'E.$), when it is noon at Boston ($71^{\circ}3'30''W.$)

(12.) A grocer lost 5 per cent. by selling a 50-pound tub of butter for \$15.20. Find cost of the butter per pound.

(13.) A commission merchant received \$20,400 with which to purchase coal at \$6.00 per ton, after deducting 2 per cent. for commission. How many tons did he buy?

(14.) Find interest on \$8,000 from November 17, 1875, to February 3, 1883, at 6½ per cent.

(15.) "\$1,000.

SAVANNAH, GA., Oct. 4, 1884.

Six months from date, for value received, I promise to pay to the order of William Proctor one thousand dollars, with interest at 6 per cent.

JOS. WHITELY."

Discounted December 31, 1884, at 8 per cent. Find the proceeds.

(16.) A man having 36 shares of 6 per cent. railroad stock, sold the same at 75, and bought city stock (10 per cent.) at 112.5. Which paid the better dividend, and how much?

(17.) If 18 men can dig a trench 200 yards long, 3 yards wide and 2 yards deep in 6 days of 8 hours each, in how many days of 10 hours each can 10 men dig a trench 100 yards long, 4 yards wide and 3 yards deep?

(18.) A grocer having sugars worth 5, 6, 9 and 10 cents, wishes to make a mixture of 180 pounds worth 7 cents per pound. How many pounds of each can he take?

(19.) Find the square root of .180625, and the cube-root of .357911.

(20.) Over how many acres of grass can a horse graze that is tied to a stake by a rope 300 yards long?

ALGEBRA.

(1.) $16 - x - [7x - \{8x - (9x - 3x - 6x)\}] = ?$

(2.) $(a^2 + 2ab + b^2)x(a^2 - 2ab + b^2) = ?$

(3.) $(2x^4 + 2x^2y^2 - 2xy^3 - 7x^3y - y^4) \div (2x^2 + y - xy) = ?$

(4.) Factor $x^4 + 10x^2 + 16$; $a^2 - 8a + 16$; $m^2 - 2m - 24$; $n^2 + 3n - 18$.

(5.) Factor $a^2 - 2ay + y^2 - x^2 - 2bx - b^2$.

(6.) Find the G. C. D. and the L. C. M. of $2x^3 - 4x^2 - 13x - 7$ and $20x^2 + 21x - 5$.

(7.) Reduce $\frac{a^2 - 2a - 3}{a^2 - 10a + 21}$ to lowest terms.

(8.) $a + x + \frac{a^2 + x^2}{a - x} = ?$

(9.) Simplify $\frac{1}{x-1} - \frac{1}{x+2} - \frac{3}{(x+1)(x+2)}$.

(10.) Simplify $1 - \frac{1}{1 + \frac{1}{x}}$.

ENGLISH.

(1.) Dictation exercise, extract from Swinton's History, Napoleon's Russian Campaign.

(2.) Define and illustrate: domestic, revelry, access, coincident, systematic, sanction, dissension, precedent, assassin, terror.

(3.) Diagram, etc.: "He who reads much always has a ready vocabulary; but he who spends his time in idle nothingness only engenders ignorance."

(4.) Parse the words underlined in the following selections:

a.—"Three weeks we westward bore,
And when the storm was o'er,
Cloud-like we saw the shore
Stretching to leeward;
There, for my lady's bower.
Built I the lofty tower,
Which to this very hour,
Stands looking seaward."

b.—“ And like those waters rushing
Among the wooden piers,
 A flood of thoughts came o’er me
That filled my eyes with tears.”

(5.) Explain the difference between the direct and the indirect object of a verb.

(6.) Distinguish between the meanings of little in “ He has but little money,” and “ He is a little fellow.”

(7.) Give the principal parts of : go, pay, sit, ride; and the participles derived from each.

(8.) Explain the difference between a possessive pronoun and a personal pronoun in the possessive case.

(9.) Define simple, complex and compound sentences.

(10.) Write a complex sentence; make the same simple, and tell what the process is called.

(11.) Compare—least, useful, beautiful.

(12.) Give the classes of pronouns, and define antecedents.

(13.) Give the divisions of time, and name all the tenses.

(14.) Give the signs of the potential and the subjunctive modes.

GEOGRAPHY—POLITICAL.

(1.) State the relative values of the commerce of the Mississippi and the Amazon. Explain.

(2.) What kind of a government is that of Russia? Who is the present ruler? What is done with convicts there?

(3.) To what country does Alaska belong? When and from what country was it purchased? Why is it valuable?

(4.) For what are the Swiss noted? What kind of a country and government have they?

(5.) Sketch the route from New Orleans to Calcutta, touching at New York and Liverpool.

PHYSICAL GEOGRAPHY.

(1.) A—By the early astronomers, what one of the planets was supposed to be in the centre of the universe? B—What is meant by the Copernican theory? C—Give the planets of the solar system in order, and state how they are classified. D—Describe the nebula theory.

(2.) A—How many motions has the earth? B—What produces the change of seasons and the alteration of day and night? C—Tell how the earth is best adapted for human habitation.

(3.) A—Have we any evidence of the internal heat of the earth? B—Give a full account of the formation, distribution and classification of volcanoes, and state the fundamental cause of volcanic action. C—How do you account for earthquakes?

(4.) A—What is said of land and water hemispheres? B—According to their relief, how are the various forms of land classified? C—How are plains classified? D—What reason can you give for plains being centres of civilization? E—What are the general decided features

of continental relief? F—Describe the relief of North America and Europe. G—How are islands formed and how classified?

(5.) A—Give the physical properties of water. B—What effects do evaporation and condensation exert? C—How are the currents of the sea classified? D—Describe the Gulf Stream.

BOOKKEEPING.

G. P. Mordecai and H. Stanford form a partnership for the purpose of conducting a wholesale shoe business; gains and losses to be divided equally.

G. P. Mordecai invests cash \$500; merchandise amounting to \$3,000. He holds James Robinson's note, dated August 1, 1892, at 12 months, for \$2,000. A. Arthur holds his note, dated November 1, 1892, at 12 months (which the firm assumes), for \$1,000.

H. Stanford invests cash \$5,000; house and lot worth \$3,000. He holds M. Brown's note, dated January 1, 1893, at 6 months, for \$1,000.

1st. Sold J. H. Shipley 400 pairs shoes at \$5. Received in part payment, cash \$1,000; balance sold on account.

2nd. Bought of Levin Lake, on firm's note, at 6 months, 1,000 pairs shoes at \$3.

3rd. Paid cash for store expenses, \$100.

4th. Bought of James Robinson, for cash, 1,000 pairs shoes at \$3.

6th. Sold J. H. Shipley, on account, 500 pairs shoes at \$5.

7th. Sold A. Arthur, on his note at 3 months, 400 pairs shoes at \$5.

8th. Bought of Thomas Fickling, on account, 400 pairs shoes at \$3.

9th. Paid cash for store expenses, \$200.

11th. Sold C. Zimmerman, for cash, 300 pairs shoes at \$5.

13th. Paid G. P. Mordecai, on private account, \$500. Paid H. Stanford, on private account, \$300.

14th. Sold J. H. Shipley 1,500 pairs shoes at \$3. Received in part payment, cash \$1,500; in part, his note, at 60 days, for \$2,000. Balance sold on account.

15th. Paid cash for store expenses, \$120.

Merchandise remaining unsold, \$900.

Write up set in day-book, cash-book and ledger. Make out statement showing condition, etc., at close.

Write out in full all the notes mentioned herein.

HISTORY.

(1.) Write a brief sketch of the colonial history of Rhode Island, Pennsylvania, New York, Maryland, Virginia and Georgia.

(2.) State briefly the causes which led to the French and Indian war, and tell the effect of this war upon our people.

(3.) State the real and apparent causes of the American Revolution, and name the leaders of the opposition from the different States.

(4.) What were the most important battles of the first and sixth years of the Revolutionary war, and what was the result of each?

(5.) What kind of government existed in the United States at the close of the Revolutionary war, and what was done to strengthen the Union?

(6.) What were the first political parties? How did they originate? Give the principles of each.

(7.) What were the functions of the general government?

(8.) State when and where Washington was inaugurated.

(9.) When, by whom and under what circumstances was the expression, "Millions for defense, but not one cent for tribute!" used?

(10.) When, by whom, from whom and for what amount were Florida and Alaska purchased?

(11.) What measure did the Whig party advocate?

(12.) During whose administration was the bank question violently agitated?

(13.) Who was the author of the expression, "To the victors belong the spoils?"

(14.) When was Texas admitted to the United States? State the real cause of the Mexican war.

(15.) What was the plan of the Mexican war, and by what three generals was it carried out?

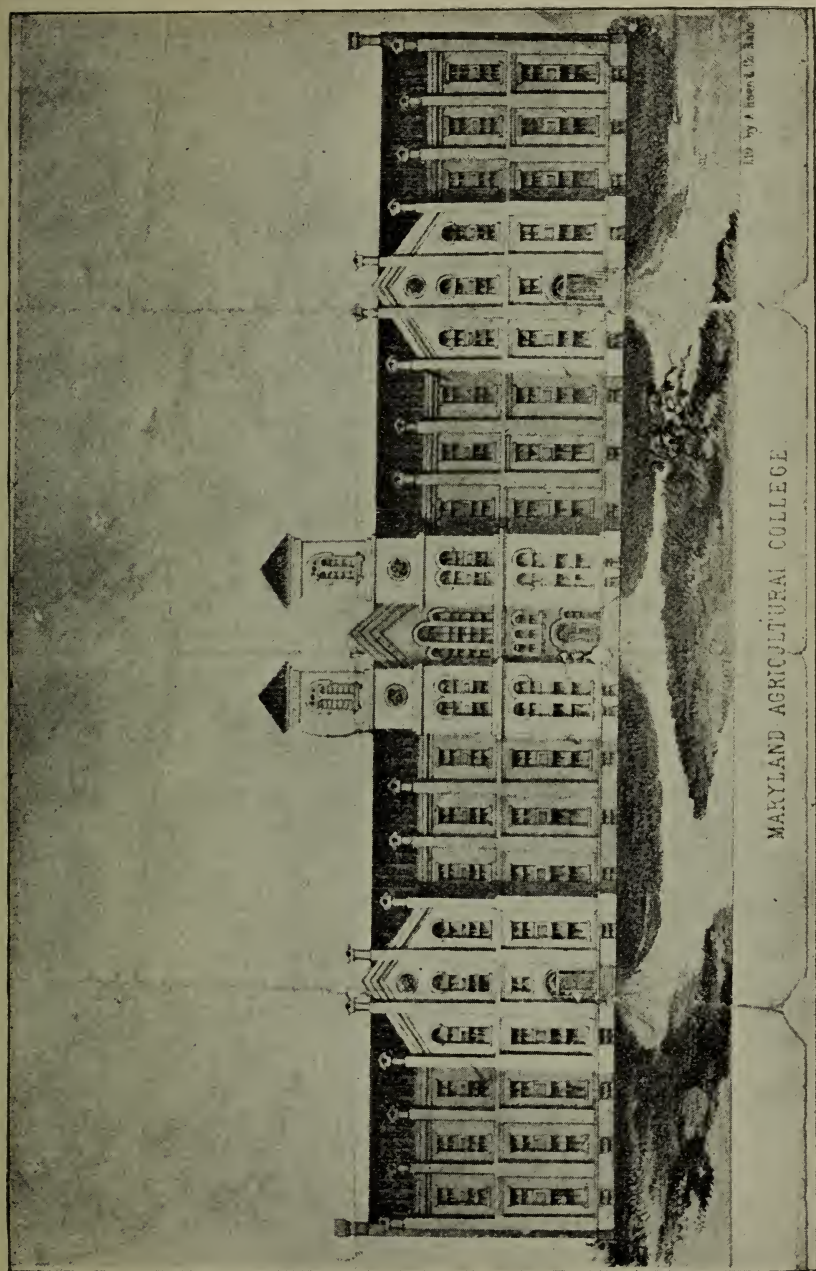
(16.) What did the compromise of 1850 embrace?

(17.) Who delivered the Dred Scott decision? Explain the same.

(18.) During whose administration did the "Reconstruction" take place? State the most important events of that administration.

(19.) What were the 13th, 14th and 15th amendments to the Constitution?

(20.) Name the four great issues of the last Presidential campaign. Name President Cleveland's Cabinet officers.



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MARYLAND AGRICULTURAL COLLEGE

AS IT APPEARS ON COMPLETION.

DEPARTMENT OF PHYSICAL CULTURE.

Sana mens in corpore sano is the twin nature of our instruction. In recent years nearly all our Colleges have added the Department of Physical Culture to the regular College curriculum, and so great has been the interest aroused in athletics, and so great the good accomplished that, as a rule, the course in this branch has been compulsory.

In our College the students of the Preparatory, Freshman and Sophomore classes are required to do regular work in the Gymnasium, under the personal supervision and instruction of the Director. Members of the Junior and Senior Classes are encouraged to continue their regular gymnastic work.

At the beginning of each scholastic year the students of the above mentioned lower classes are measured and have their strength tested. The result of these measurements is carefully recorded, and at the end of the year this process is repeated, and thereby an accurate estimate is obtained of their physical development. By this means a student's physical defects may be discovered, and rational instruction given, whereby they may be remedied.

Since the erection of the Gymnasium and its equipment with modern apparatus and every facility for the proper development of a physical man, great progress has been made in this department. The following is the course of instruction given in the Gymnasium:

Free Movements—Introductory exercises, without apparatus, for stretching the muscles, making supple the joints and setting up the figure. Light gymnastic exercises with modern dumb-bells and clubs, strengthening the muscles of the arms, chest, back and shoulders, in the preparation for the practice of heavy gymnastics.

Heavy Gymnastics—Vaulting, horizontal and parallel bars, flying and traveling rings, horse, tumbling, jumping, etc.

Boxing—Individual instruction in the different blows and parries, and methods of training by the use of dumb-bells, striking bags, etc.

Fencing—Introduction and positions, lines of engagements, parries, attacks, etc.

Track and Field Athletics—Methods of starting and training for sprint and long distance running, practice in field games, such as baseball, foot-ball, tennis, shot putting, pole vaulting and other sports. A valuable adjunct to this department is the College Athletic Association, whose membership is composed of a majority of all the students and the Faculty. This organization has been a great factor in fostering an interest in matters athletic, and by its initiation fees and monthly dues contributes largely to the defraying of the expenses of the College teams, the members of which are chosen from its roll. It also gives two or more entertainments each year, the proceeds of which are devoted to the same object. The following have been the Presidents of the association since its organization: Professor Strickler, Professor Spence, Cadets Sothoron Key, J. G. Bannon, G. M. Harris. The officers of the

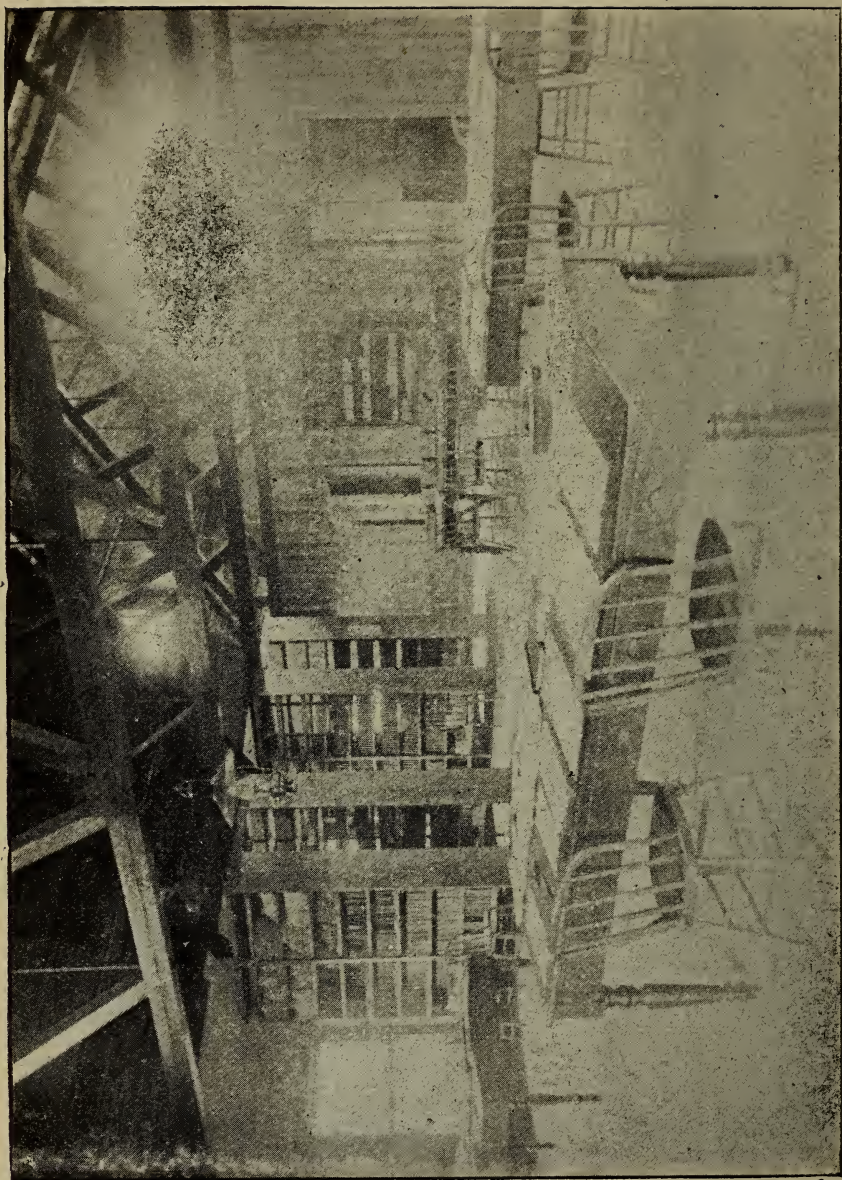
present term are: Professor Strickler, President; Cadet G. W. K. Schenck, Vice-President; Cadet A. S. Gill, Secretary; Cadet J. G. R. Graham, Treasurer.

The record of our teams in foot-ball and base-ball since the erection of the Gymnasium have been very gratifying. Foot-ball of 1893—1 game lost, 7 won; foot-ball of 1894—2 games lost, 4 won; base-ball of 1894—1 game lost, 7 won; base-ball of 1895—2 games lost, 6 won.

I wish to acknowledge with gratitude the encouragement given this department of our College by the Trustees, and the kind co-operation of President Silvester and the Faculty in its advancement.

LIBRARY.

The College Library is slowly assuming its proper place as one of the most important departments of the institution. The addition to its volumes during the past two years has necessarily been somewhat limited. Several gifts of books, however, in the shape of valuable Government reports have been received. The present accommodations are comfortable and adequate, affording a well furnished and comfortable reading room for students, which is very generally used. The organization and management of the Library under Mr. R. R. Pue, Librarian, has been entirely satisfactory. It is to be hoped that this invaluable help to the work of the whole College will continue to increase its sphere of usefulness.



A CORNER IN THE LIBRARY.

STUDENT ORGANIZATIONS.

LITERARY CLUBS.

In recent years a decided interest has been evinced by our students in Literary and Debating Societies. During the sessions of '94-'95, the House of Commons of the Maryland Agricultural College was organized. Its membership was composed of the Faculty and the Senior and Junior classes. The Sophomore class organized the Spencerian Literary and Debating Society. There was a similar organization of the Freshman class, known as the Calvert Society.

During the present year these societies have been reorganized, and are now as follows: The Senate of the Maryland Agricultural College, consisting of the members of the two upper classes and members of the Faculty; The House of Representatives of the Maryland Agricultural College, consisting of the Sophomore class and members of the Faculty, the Freshman, Literary and Debating Society.

As a means of giving the student confidence and ease before an audience, and a familiarity with parliamentary procedure, these societies perform a very important function in the Collegiate course, and every encouragement is given them.

SOCIAL CLUB.

By joining the Rossburg Club, students who are socially inclined, are given ample opportunity for enjoyment. The officers of this Club are selected from the Senior class, and dances are given from time to time, as College work permits.

A committee of the Faculty supervises these entertainments.

GLEE CLUB.

The College Glee Club affords the students an opportunity for practice in musical matters, and to develop any musical talent he may possess.

ALUMNI ASSOCIATION.

The present officers of the Alumni Association are as follows:

R. B. B. Chew, Jr.....	President.
W. Skinner.....	Vice-President.
F. B. Bomberger.....	Secretary.
J. G. Bannon.....	Treasurer.

Executive Committee. { F. P. Veitch,
P. A. Bowen,
Sothoron Key.

This association has within the last four years been reorganized upon a permanent basis. And, if the present interest now shown by the former students of the College, in its welfare and progress continues active, the organization will prove of the greatest service to the institution. Annual meetings are held at the College during commencement week.

COURSES OF STUDY.

The following outlines of the four courses of study now offered by the College will serve to illustrate the scope of the work being done. The Mechanical Course is now under way, and is proving the wisdom of the movement by the Board of Trustees to establish it.

AGRICULTURAL COURSE.

(Studies and hours per week).

SENIOR CLASS.

English—2 hours, recitation (1st and 2nd term.)

History—Civics, 5 hours, recitation (1st and 2nd term.)

Agriculture—2 hours, recitation; 2 hours, practical (1st and 2nd term.)

Mathematics—1 hour, recitation (1st and 2nd term.)

Modern Languages—French, 3 hours, recitation (1st and 2nd term.)

Mechanics—1st term, 2 hours, recitation; 2nd term, optional.

Military Science—2 hours, recitation; 4 hours, practical 1st and 2nd.)

Natural History—1st term, 2 hours, Biology; 2 hours, Botany; 2nd, optional.

Physics—2 hours, recitation; 2 hours, practical; 2nd term, optional.

Chemistry—2 hours, recitation; 2 hours, practical; 2nd term, optional.

Drawing—1 hour, Mechanical, practical; 2nd term, optional.

JUNIOR CLASS.

English—3 hours, recitation (1st and 2nd term.)

History—Reading, 2 hours, (1st and 2nd term.)

Agriculture—3 hours, recitation; 2 hours, practical (1st and 2nd term.)

Mathematics—2 hours, recitation (1st and 2nd term.)

Modern Language—French, 3 hours, recitation (1st and 2nd term.)

Mechanics—2 hours, recitation (1st and 2nd term.)

Military Science—2 hours, recitation; 4 hours, practical (1st and 2nd.)

National History—1st term, 2 hours, Zoology; 2 hours, Botany; 2nd, 4 hours, Physiology.

Physics—2 hours, recitation; 2 hours, practical (1st and 2nd term.)

Chemistry—2 hours, recitation; 2 hours, practical (1st and 2nd term.)

Drawing—1 hour, Mechanical (2nd term.)

SOPHOMORE CLASS.

English—4 hours, recitation (1st and 2nd term.)

History—Reading, 2 hours (1st and 2nd term.)

Agriculture—2 hours, recitation; 1 hour practical (1st and 2nd term.)

Modern Languages—German, 4 hours, recitation (1st and 2nd term.)

Mechanics—1 hour, Iron-work (1st and 2nd term.)

Military Science—4 hours, practical and theoretical (1st and 2nd term.)

Natural History—1st term, 2 hours, Physiology; 2nd, 2 hours, Botany.

Physics—2 hours, recitation (1st and 2nd term.)

Chemistry—2 hours, recitation; 1 hour, practical (1st and 2nd term.)

Drawing—2 hours, Mechanical (1st term.)

FRESHMAN CLASS.

English—5 hours, recitation (1st and 2nd term.)

History—2 hours, recitation (1st and 2nd Term.)

Agriculture—3 hours, recitation; 2 hours, practical (1st and 2nd term.);

Mathematics—3 hours, recitation (1st and 2nd term.)

Modern Languages—German, 4 hours, 1st term; 3 hours, 2nd term.

Mechanics—1 hour, Wood-work (1st and 2nd term.)

Book-Keeping—1 hour, practical 1st and 2nd term.)

Military Science—4 hours, practical and theoretical (1st and 2nd term.)

Natural History—3 hours, 1st term, Botany; 2nd Geology and Physical Geography.

Physics—1 hour, Mechanical powers (1st and 2nd term.)

Drawing—2 hours, Free-hand, practical (1st and 2nd term.)

MECHANICAL COURSE.

(Studies and hours per week).

SENIOR CLASS.

English—2 hours, recitation (1st and 2nd term.)

History—Civics, 5 hours, recitation (1st and 2nd term.)

Mechanics—5 hours, recitation (1st and 2nd term.)

Wood and Iron Work—2 hours, Iron Work (1st and 2nd term.)

Mathematics—4 hours, recitation (1st term); 1 hour (2nd term.)

Modern Languages—3 hours, *French* (1st term); 2nd term, optional.

Physics—2 hours, recitation; 4 hours, practical; 2nd term, optional.

Military Science—2 hours, recitation; 4 hours, practical (1st and 2nd.)

Drawing—4 hours, Mechanical (1st and 2nd term.)

JUNIOR CLASS.

English—3 hours, recitation (1st and 2nd term.)

History—Reading, 2 hours (1st and 2nd term.)

Mechanics—3 hours, recitation (1st term); 4 hours (2nd term.)

Wood and Iron Work—2 hours, Iron-work (1st and 2nd term.)

Mathematics—2 hours, recitation (1st term); 4 hours, 2nd term.)

Modern Languages—French, 3 hours (1st and 2nd term.)

Physics—2 hours, recitation; 2 hours, practical (1st and 2nd term.)

Military Science—2 hours, recitation; 2 hours, practical (1st and 2nd.)

Chemistry—2 hours, recitation; 2 hours, practical (1st term.)

Drawing—3 hours, Mechanical (1st and 2nd term.)

SOPHOMORE CLASS.

English—4 hours, recitation (1st and 2nd term.)

History—Reading, 2 hours (1st and 2nd term.)

Wood and Iron Work—2 hours, Wood-work (1st and 2nd term.)

Mathematics—3 hours, recitation (1st and 2nd term.)

Modern Languages—German, 4 hours, 1st term; 3 hours, 2nd term.

Physics—2 hours, recitation (1st and 2nd term.)

Military Science—1 hour, recitation; 4 hours, practical (1st and 2nd.)

Natural History—2 hours, Physiology (1st term); 2 hours, Botany, (2nd.)

Chemistry—2 hours, recitation; 2 hours, practical (1st and 2nd term.)

Drawing—2 hours, Mechanical (1st and 2nd term.)

FRESHMAN CLASS.

English—5 hours, recitation (1st and 2nd term.)

History—2 hours, recitation (1st and 2nd term.)

- Wood and Iron Work*—2 hours, Wood-work (1st and 2nd term.)
Mathematics—1 hour, recitation, 1st term; 3 hours, recitation. 2nd term.
Modern Languages—*German*, 4 hours, 1st term; 3 hours, 2nd term.
Book-Keeping—1 hour, practical (1st and 2nd term.)
Physics—1 hour, Mechanical Powers (1st and 2nd term.)
Military Science—4 hours, practical and theoretical (1st and 2nd term.)
Natural History—3 hours, Botany, 1st term; 3 hours, Physical Geography, 2nd.
Drawing—2 hours, Free-hand (1st and 2nd term.)

SCIENTIFIC COURSE.

(Studies and hours per week.)

SENIOR CLASS.

- English*—2 hours, recitation (1st and 2nd term.)
History—Reading and Civics, 5 hours (1st and 2nd term.)
Modern Languages—*French*, 3 hours, 1st term; 2nd term, optional.
Chemistry—1st term, 2 hours, recitation; 4 hours, practical; 2nd, optional.
Physics—2 hours, recitation; 4 hours, practical; 2nd term, optional.
Mathematics—1st term, 1 hour, recitation; 2nd term, optional.
Military Science—2 hours, recitation; 4 hours, practical (1st and 2nd.)
Natural History—1st term, 2 hours, Biology; 2 hours, Botany; 2nd term, optional.
Drawing—2 hours, Mechanical (1st term.)

JUNIOR CLASS.

- English*—3 hours, recitation (1st and 2nd term.)
Modern Languages—*French*, 3 hours (1st and 2nd term.)
Chemistry—2 hours, recitation; 2 hours, practical (1st and 2nd term.)
Physics—2 hours, recitation; 2 hours, practical (1st and 2nd term.)
Mathematics—2 hours, recitation (1st and 2nd term.)
Military Science—2 hours, recitation; 4 hours, practical (1st and 2nd.)
Natural History—2 hours, Zoology (1st and 2nd); 2 hours, Botany (2nd.)
Drawing—1 hour, Mechanical (2nd term.)

SOPHOMORE CLASS.

- English*—4 hours, recitation (1st and 2nd term.)
History—Reading, 2 hours (1st and 2nd term.)
Modern Languages—*German*, 4 hours, 1st term; 3 hours, 2nd term.
Chemistry—2 hours, recitation, 1st and 2nd; 1 hour, practical, 1st; 2 hours, 2nd.
Physics—2 hours, recitation (1st and 2nd term.)
Mathematics—3 hours, recitation (1st and 2nd.)
Military Science—1 hour, recitation; 4 hours, practical (1st and 2nd.)
Natural History—2 hours, Physiology, 1st; 2 hours, Botany, (2nd term.)
Drawing—2 hours, Mechanical (1st term.)

FRESHMAN CLASS.

- English*—5 hours, recitation (1st and 2nd term.)
History—2 hours, recitation (1st and 2nd term.)
Modern Languages—*German*, 4 hours, 1st term; 3 hours, 2nd term.
Physics—1 hour, Mechanical Powers (1st and 2nd term.)
Mathematics—3 hours, recitation (1st and 2nd term.)
Military Science—4 hours, practical and theoretical (1st and 2nd term.)
Book-Keeping—1 hour practical (1st and 2nd term.)
Natural History—3 hours, Botany, 1st term; 3 hours, Physical Geography, 2nd.
Drawing—2 hours, Free-hand (1st and 2nd term.)

CLASSICAL COURSE.

(Studies and hours per week).

SENIOR CLASS.

- English*—4 hours, 1st term; 2 hours, 2nd term.
History—Civics, 5 hours, recitation (1st and 2nd term.)
Latin—5 hours, 1st term; 4 hours, 2nd term.
Modern Languages—*French*, 4 hours, recitation (1st and 2nd term.)
Mathematics—1 hour, 1st term; 2nd term, optional.
Military Science—2 hours, recitation; 4 hours, practical (1st and 2nd.)

JUNIOR CLASS.

- English*—5 hours, recitation (1st and 2nd term.)
History—2 hours, reading (1st and 2nd term.)
Latin—5 hours, recitation, (1st and 2nd term.)
Modern Languages—*French*, 3 hours, recitation (1st and 2nd term.)
Mathematics—2 hours, recitation (1st and 2nd term.)
Military Science—2 hours, recitation; 4 hours, practical (1st and 2nd.)

SOPHOMORE CLASS.

- English*—4 hours, recitation (1st and 2nd term.)
History—Reading, 2 hours, (1st and 2nd term.)
Latin—4 hours, recitation (1st and 2nd term.)
Modern Languages—*German*, 4 hours, 1st term; 3 hours 2nd term.
Mathematics—3 hours, recitations (1st and 2nd term.)
Physics—2 hours, recitation (1st and 2nd term.)
Chemistry—2 hours, recitation; 1 hour, practical (1st and 2nd term.)
Military Science—1 hour, recitation; 4 hours, practical (1st and 2nd.)
Natural History—2 hours, Physiology, 1st term; 2 hours, Botany, 2nd.
Drawing—2 hours, Mechanical (1st term.)

FRESHMAN CLASS.

- English*—5 hours, recitation (1st and 2nd term.)
History—2 hours, recitation (1st and 2nd term.)
Latin—4 hours, recitation (1st and 2nd term.)
Modern Languages—*German*, 4 hours, 1st term; 3 hours, 2nd term.
Mathematics—3 hours, recitation (1st and 2nd term.)

Military Science—4 hours, practical and theoretical (1st and 2nd.)

Book-Keeping—1 hour, practical (1st and 2nd term.)

Natural History—3 hours, Physical Geography and Geology, 2nd term.

Drawing—2 hours, Free-hand (1st and 2nd term.)



BIOLOGICAL LECTURE ROOM AND LABORATORY.

LIST OF STUDENTS

ENROLLED DURING CALENDAR YEAR, 1895.

Adams, James O.	Frederick County.	Chambers, J. Wesley	Frederick County.
Allnutt, Claude V.	Montgomery County.	Ching, Oscar F.	Pennsylvania.
Anderson, James	Montgomery County.	Church, C. C.	Prince George's County.
Archer, James G.	Harford County.	Church, Irwin	Prince George's County.
Bannon, Joseph G.	Anne Arundel County.	Clagett, G. Harry	Prince George's County.
Barber, Peter W. C.	Charles County.	Colbert, James A.	Frederick County.
Beale, Robert B.	District of Columbia.	Colonna, Aylett J.	Virginia.
Behrens, Fred. Wm.	Prince George's County.	Combs, Daniel	St. Mary's County.
Bellis, George	Prince George's County.	Combs, Robert L.	St. Mary's County.
Betton, John J.	Baltimore City.	Compton, Barnes, Jr.	Prince George's County.
Blandford, John C.	Prince George's County.	Crapster, Thad. G.	Carroll County.
Bready, Harry Y.	Baltimore City.	Crapster, Wm. B.	Carroll County.
Brinkley, Ernest H.	Prince George's County.	Crew, Fountain	Kent County.
Brydon, Sam'l B.	Baltimore City.	Cronmiller, John D.	Prince George's County.
Burke, Myron	Prince George's County.	Counselman, Lee	Montgomery County.
Burroughs, C. Rudolph	Charles County.	Denby, Stephen F.	District of Columbia.
Briscoe, John P.	Calvert County.	Dennison, Robert E.	District of Columbia.
Cadle, John S.	Prince George's County.	Dent, Warren L.	Charles County.
Caldwell, Harry C.	District of Columbia.	Dickerson, Edw. T.	Montgomery County.
Calvert, Chas. B.	Prince George's County.	Dirickson, Cyrus W.	Worcester County.
Cameron, Geo. W.	Cecil County.	Dirickson, E. F.	Worcester County.
Carter, Robert W.	Illinois.	Dirickson, Levin	Worcester County.

LIST OF STUDENTS ENROLLED DURING CALENDAR YEAR, 1895.

Dorsey, R. Luke	St. Mary's County.	Harding, Samuel H.	Howard County.
Dorsey, John P.	Calvert County.	Haar, Walter R.	Montgomery County.
Duffy, Peter J.	Prince George's County.	Harris, George M.	District of Columbia.
Edelen, Geo. S.	Prince George's County.	Harrison, Roland L.	St. Mary's County.
Emack, Henry G.	Pennsylvania.	Hay, Edwin B.	District of Columbia.
Eversfield, Donald	Prince George's County.	Heiner, Robert G.	District of Columbia.
Fox, Thos. H.	District of Columbia.	Henderson, G. P.	Montgomery County.
Fox, Wm. S.	District of Columbia.	Herrell, G. N.	District of Columbia.
Fowler, Owen H.	District of Columbia.	Heward, Harry	Worcester County.
Freeman, Marshall T.	Charles County.	Heyser, Harvey	Washington County.
Fuller, Clifton E.	Allegany County.	Hinebaugh, Wade H.	Garrett County.
Galt, M. H.	Carroll County.	Holly, Wm. A.	North Carolina.
Gardiner, Hugh C.	Charles County.	Hopkins, Matthew S.	Howard County.
Gasch, Ernest F.	Prince George's County.	Hopkins, Samuel H.	Howard County.
Gill, Arthur H.	Baltimore County.	Houston, Levin J.	Worcester County.
Gill, Albert S.	Baltimore City.	Houston, Wm. H.	Worcester County.
Gill, Nicholas H.	Baltimore City.	Jenifer, P. C. R.	Baltimore County.
Goldsborough, E. Lee	Frederick County.	Johnston, Robert S.	Prince George's County.
Gough, T. B.	St. Mary's County.	Johnston, Walter B.	Prince George's County.
Graham, J. G. R.	Queen Anne County.	Jones, Henry C.	Worcester County.
Graham, Harry R.	Queen Anne County.	Jones, J. A.	Montgomery County.
Grandy, W. H.	North Carolina.	Jones, J. Jolly	District of Columbia.
Grason, A. S. R.	Baltimore County.	Kenly, J. F.	Harford County.
Hammond, Wm. A.	Baltimore City.	Lake, Levin	Baltimore County.

LIST OF STUDENTS ENROLLED DURING CALENDAR YEAR, 1895.

Lake, Lewis W.		Muller, Chas. W.	
Baltimore County.		Baltimore City.	
Laughlin, John R.		Naylor, Harry A.	
Pennsylvania.		Baltimore County.	
Leatherman, Clarence G.		Nelligan, Bert S.	
Frederick County.		Nebraska.	
LeFevre, Frank T.		Nesbitt, Wm. C.	
Carroll County.		Montgomery County.	
Leighton, Joseph		Odenheimer, John	
District of Columbia.		Anne Arundel County.	
Lewis, Grenville		Owens, Herbert H.	
District of Columbia.		Baltimore City.	
Lillibridge, John A.		Parsons, John H.	
Prince George's County.		St. Mary's County.	
Lindsay, E. Parke		Pierce, F. M.	
Virginia.		Montgomery County.	
Loker, Wm. A.		Pembroke, Hugh	
St. Mary's County.		Anne Arundel County.	
Lowe, L. Reese		Peterson, George	
Wicomico County.		Calvert County.	
Martin, Wm. M.		Posey, Fabian	
Dorchester County.		Charles County.	
Mathews, Andrew A.		Posey, Francis W.	
Baltimore County.		Charles County.	
Mattingly, Wm. F.		Pyles, J. B.	
St. Mary's County.		Montgomery County.	
Mattingly, Wm. W.		Pyles, W. W.	
St. Mary's County.		Montgomery County.	
McCandlish, Lindsay		Queen, Chas. J.	
West Virginia.		Charles County.	
McCandlish, Robert J.		Quillin, Samuel M.	
West Virginia.		Worcester County.	
McCeney, Edgar S.		Ramsay, Chas. R.	
District of Columbia.		Baltimore City.	
McDonnell, Curtis C.		Richmond, Sidney	
Pennsylvania.		Charles County.	
Milleson, Ernest M.		Ridgely, Chas. H.	
Allegany County.		Carroll County.	
Mitchell, John H.		Robb, John B.	
Charles County.		Virginia.	
Mordecai, David H.		Robb, Philip L.	
Baltimore County.		Virginia.	
Mordecai, Geo. P.		Roberts, Richard	
Baltimore County.		Prince George's County.	
Mordecai, Lewis S.		Roberts, Wm. W.	
Baltimore County.		Prince George's County.	
Mullikin, Clarence S.		Robertson, Geo. W.	
Prince George's County.		Somerset County.	

LIST OF STUDENTS ENROLLED DURING CALENDAR YEAR, 1895.

Robinson, James B.	Prince George's County.	Turner, Aquila	Prince George's County.
Robinson, Walter H.	Prince George's County.	Turner, Joseph	Prince George's County.
Rollins, Wm. T. S.	Prince George's County.	Twining, Albert B.	Harford County.
Sappington, Nelson	Harford County.	Upshur, Levin	Baltimore City.
Sappington, Walter H.	Harford County.	Vandeventer, H. E.	District of Columbia.
Sappington, Wm. F.	Harford County.	Van Dyck, John H.	Virginia.
Schenek, Garry W.	New York.	Walker, Clarence N.	Prince George's County.
Sellman, Francis S.	Anne Arundel County.	Walker, Geo. C.	Prince George's County.
Sherman, Franklin	Virginia.	Walsh, Ferd. C.	Montgomery County.
Shipley, Jas. H.	Prince George's County.	Watkins, Benj.	Anne Arundel County.
Shreve, Chas. A.	Prince George's County.	Weedon, Wm. S.	Baltimore City.
Skinner, Wm.	Dorchester County.	Welty, Harry T.	Prince George's County.
Sligar, Richard E.	West Virginia.	Wharton, Thos. P.	Worcester County.
Smith, Ralph W.	Pennsylvania.	Whiteford, Gilbert H.	Baltimore County.
Stanford, Harry R.	District of Columbia.	Whitehill, I. E.	Frederick County.
Steiger, Walter	Prince George's County.	Whitely, Richard P.	Prince George's County.
Stevens, Bruce	Caroline County.	Williamson, H. A.	Allegany County.
Straughn, M. N.	Queen Anne County.	Wilsie, Jerome C.	Prince George's County.
Talbott, Benj. E.	Calvert County.	Wilson, Geo. W.	Prince George's County.
Taylor, Jos. L.	Baltimore County.	Wooters, Wm. A.	Talbott County.
Timanus, John J.	Baltimore County.	Wootton, Roland	Montgomery County.
Trueworthy, F. H.	District of Columbia.	Wootton, Wm. T.	Montgomery County.

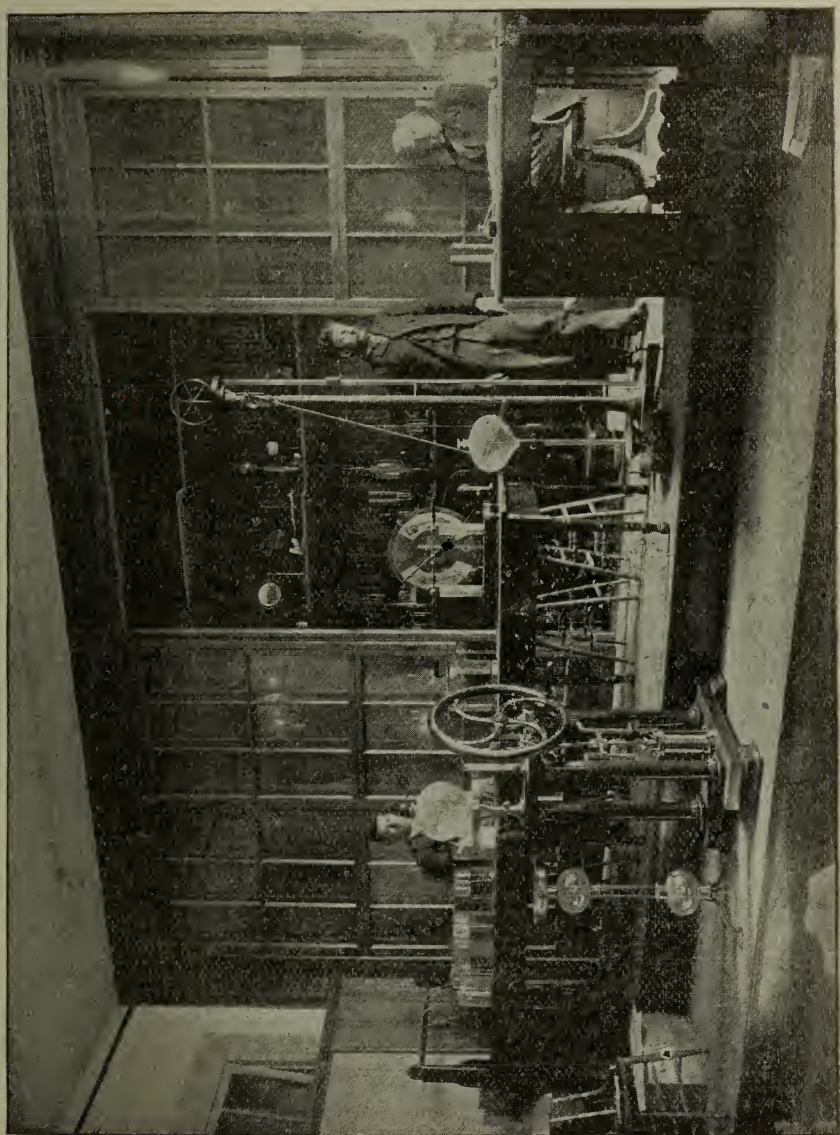
SUMMARY BY COUNTIES, ETC.

Allegany County.....	2	Howard County.....	3
Anne Arundel County.....	6	Kent County.....	1
Baltimore County.....	12	Montgomery County.....	14
Calvert County.....	4	Prince George's County.....	37
Caroline County.....	1	Queen Anne County.....	2
Carroll County.....	5	Somerset County.....	1
Cecil County.....	1	St. Mary's County.....	9
Charles County.....	10	Talbott County.....	1
Dorchester County.....	2	Washington County.....	1
Frederick County.....	6	Wicomico County.....	1
Garrett County.....	1	Worcester County.....	9
Harford County.....	6	Baltimore City.....	11

Total number from Maryland.....147

District of Columbia.....	19
Illinois.....	1
Nebraska.....	1
New York	1
North Carolina.....	2
Pennsylvania.....	5
Virginia.....	6
West Virginia.....	3

Total..... 185



PHYSICAL LABORATORY.

FACULTY AND ORGANIZATION.

R. W. SILVESTER,

President and Professor of Mathematics.

RICHARD H. ALVEY,

Vice-President and Professor of English and Civics.

CLOUGH OVERTON,

1st Lieut. U. S. Cavalry, Professor of Military Science and Commandant
of Cadets.

W. T. L. TALIAFERRO,

Professor of Agriculture.

MARTIN P. SCOTT, M. D.

Professor of Natural History.

THOMAS H. SPENCE,

Professor of Languages.

J. D. FORD, U. S. N.,

Professor of Mechanical
Engineering.

H. M. STRICKLER,

Professor of Physical Culture.

H. B. McDONNELL, M. A., B. S.

Professor of Chemistry.

JAS. S. ROBINSON,

Professor of Horticulture.

HORACE G. WELTY,

Prof. of Physics and Applied
Mathematics.

HENRY T. HARRISON,

Principal Preparatory Department.

DR. ROBERT WARD, F. R. C. V. S.

Professor Veterinary Science.

H. C. SHERMAN, B. S.

F. P. VEITCH, B. S.

F. B. BOMBERGER, B. S.

W. W. SKINNER, B. S.

C. C. McDONNELL, B. S.

Assistants in Chemistry.

HARRY GWINNER,.....Assistant Prof. in Mechanical Engineering.

R. R. PUE, B. S.....Librarian.

DR. JOS. R. OWENS,....Treasurer.

C. A. WOODHEAD.....Stenographer.

MILITARY ORGANIZATION.

Commandant of Cadets,

CLOUGH OVERTON, 1st. Lieut. U. S. Cavalry.

Major Commanding Cadets,

Wm. T. S. ROLLINS.

OFFICERS OF COMMISSIONED AND NON-COMMISSIONED STAFF.

2nd Lieut. and Adjutant.....G. K. W. SCHENCK.
 2nd Lieut. and Quarter Master.....J. R. LAUGHLIN.
 Sergeant-MajorJ. D. CRONMILLER.
 Quarter-Master and Color Sergeant.....G. H. WHITEFORD.
 Trumpeter.....GEO. P. MORDECAI.

COMPANY "A."

Captain.....T. G. CRAPSTER.
 1st Lieut.....DONALD EVERSFIELD,
 1st Sergeant.....GRENVILLE LEWIS.

Sergeants.

B. S. NELLIGAN,
 BENJ. WATKINS,
 C. J. QUEEN,
 AQUILA TURNER.

Corporals.

W. F. SAPPINGTON,
 H. A. NAYLOR,
 W. S. WEEDON.

COMPANY "B."

Captain.....C. W. DIRICKSON,
 1st Lieutenant.....R. B. BEALE.
 1st Sergeant.....J. G. R. GRAHAM.

Sergeants.

H. HEWARD,
 F. POSEY,
 N. H. GILL,
 J. A. LILLIBRIDGE.

Corporal.

C. A. SHREVE,
 F. H. TRUEWORTHY,
 W. H. SAPPINGTON.

COMPANY "C."

Captain.....JAS. ANDERSON,
 1st Lieut.....H. HEYSER,
 1st Sergeant.....A. S. GILL.

Sergeants.

G. H. WHITEFORD,
 H. T. WELTY,
 I. E. WHITEHILL,
 LEVIN LAKE.

Corporals.

C. V. ALLNUTT,
 R. E. DENNISON,
 P. L. ROBB.

BOARD OF TRUSTEES.

Members Ex-Officio Under State Law.

HIS EXCELLENCY, LLOYD LOWNDES, GOVERNOR.....	President of the Board.
HON. ROBERT P. GRAHAM.....	Comptroller of Treasury.
HON. H. M. CLABAUGH.....	Attorney-General.
HON. THOMAS J. SHRYOCK.....	State Treasurer.
HON. WM. CABELL BRUCE.....	President of the Senate.
HON. SIDNEY E. MUDD.....	Speaker House of Delegates.

Members Elected by Stockholders.

HON. MURRAY VANDIVER.....	Havre de Grace, Harford Co., Md.
HON. WILMOT JOHNSON.....	Catonsville, Baltimore County, Md.
CHAS. B. CALVERT, Esq.....	College Park, Prince George's Co., Md.
ALLEN DODGE, Esq.....	Washington, D. C.
CHAS. H. STANLEY, Esq.....	Laurel, Prince George's Co., Md.

Members by Executive Appointment.

C. J. PURNELL, Esq., Snow Hill, Worcester Co., Md.....	<i>Term Expires.</i> 1900.
HON. DAVID SEIBERT, Clear Spring, Washington Co., Md....	1900.
W. W. McINTYRE, Baltimore, Md	1902.
W. SCOTT WHITEFORD, Harford Co., Md.....	1902.
HON. ROBERT MOSS, Annapolis, Md	1898.
HON. CHAS. H. EVANS, Baltimore, Md.....	1898.

Maryland Agricultural College.

THIRTY-SIXTH YEAR.

THE CLOSING EXERCISES JUNE 15-19, 1895.

COLLEGE STATION, PRINCE GEORGE'S COUNTY, MD.

Alumni, former students and all visitors of the College are requested to register their names at the President's Office, in the College Building, as soon as possible after their arrival.

PROGRAMME OF PUBLIC EXERCISES.

SATURDAY, JUNE 15th.

8 p. m.—Address before Young Men's Christian Association by Rev. J. H. BUTLER, of Washington, D. C.

SUNDAY, JUNE 16th.

4 P. M.—Baccalaureate Sermon by Rev. JULIUS E. GRAMMAR, of Baltimore, Md.

MONDAY, JUNE 17th.

10 A. M.—Field Sports on College Campus by M. A. C. Athletic Association

3 P. M.—Public Meeting of the Athletic Association, in the College Hall.

8 P. M.—Public Meeting of the M. A. C. House of Commons, in the College Hall.

TUESDAY, JUNE 18th.

10.30 A. M.—Public Meeting of Literary Society, in the College Hall.

2.30 P. M.—Company and Individual Competitive Drills and Competitive Target Practice, on College Campus.

8 P. M.—Class-Day Exercises in College Hall. Address by Prof. THOS. H. SPENCE, Maryland Agricultural College.

WEDNESDAY, JUNE 19th.

2.30 P. M.—Commencement Exercises in College Hall.

4.30 P. M.—Exhibition Drill on College Campus.

5 P. M.—Annual Meeting of Alumni Association in College Library.

9 P. M.—Thirty-Sixth Annual Ball, in the College Hall.

Music Furnished by the Naval Academy Band.

COMMENCEMENT EXERCISES,

WEDNESDAY, JUNE 19, 1895, COLLEGE CHAPEL.

—*Music*—

ADDRESS TO GRADUATES.... By H. O. DEVRIES, Master of State Grange.

—*Music*—

VALEDICTORY ADDRESS..... By W. W. SKINNER.

—*Music*—

PRESENTATION OF DIPLOMAS AND PRIZES,

By HIS EXCELLENCY GOVERNOR BROWN.

Music Furnished by the Naval Academy Band.

CLASS-DAY EXERCISES,

TUESDAY, JUNE 18th.

Formal Entry of Senior Class.

Class History and Prophecy—H. C. JONES.

Class Ode—R. E. SLIGER—Sung by Class.

Formal Entry of Junior Class.

Senior Class Address—H. R. GRAHAM.

Presentation of Class Shield.

Junior Class Address—W. S. ROLLINS.

Installation of Junior Class Officers.

Resolutions by Junior Class.

Address upon Resolutions—H. H. HEYSER.

Formal Adjournment.

Address to Outgoing and Incoming Senior Classes—

Prof. THOMAS HUMPHREYS SPENCE.

GRADUATING CLASS AND THESES, 1895.

JOSEPH G. BANNON.....	Prince George's County, Md. "The Crusades."
GUYGER H. CLAGETT.....	Prince George's County, Md. "Stock Raising."
BARNES COMPTON, Jr.....	Prince George's County, Md. "The Nicaragua Canal—Ours or England's?"
WILLIAM B. CRAPSTER.....	Carroll County, Md. "Irrigation."
GEORGE S. EDELEN.....	Prince George's County, Md. "Development."
HARRY R. GRAHAM.....	Queen Anne County, Md. "Our National Institutions—Are they to be Permanent?"
SAMUEL H. HARDING.....	Howard County, Md. "Modern Athletics in our Colleges and Universities."
ROLAND L. HARRISON.....	St. Mary's County, Md. "The Science of History as a Sphere of Useful Knowledge."
H. CLAUDE JONES.....	Worcester County, Md. "Inland Waterways of America."
LINDSAY McCANDLISH.....	Piedmont, W. Va. "Why the Government Should Control the Railroads."
CURTIS C. McDONNELL.....	Florence, Pa. "The Water Supply of the College."
CLARENCE S. MULLIKIN.....	Prince George's County, Md. "The Relation of Living Organisms to their Environment."
WILLIAM W. SKINNER.....	Dorchester County, Md. "Fermentation."
R. EDWARD SLIGER.....	Piedmont, W. Va. "Immigration?"
J. JACOB TIMANUS..... "The 19th Century; an Age of Physical Triumphs."
GEO. W. WILSON, Jr.....	Prince George's County, Md. "The Realm of the Microbe."

AWARDS AND PRIZES DELIVERED ON COMMENCEMENT DAY,

JUNE 15th, 1895.

W. B. CRAPSTER.....Senior Class.

General average for four years, 94 per cent. Gold Medal by the President.

W. W. ROBERTS.....Junior Class.

General average for three years, 90 per cent. Gold Medal by the President.

A. S. GILL.....Sophomore Class.

Best Historical Thesis. Prescott's Works, by the Vice-President.

AQUILA TURNER.....Freshman Class.

Best Oration. Shakespere's Works, by the Vice-President.

GRENVILLE LEWIS.....Sophomore Class.

Excellence in Drawing. Gold Pen, by Lieut. J. D. Ford.

HUGH PEMBROKE.....Freshman Class.

Excellence in Drawing. Gold Pen, by Lieut. J. D. Ford.

W. B. CRAPSTER..... Captain Co. "C."

Best drilled Company. Gold Medal, Lieut. J. S. Grisard.

G. W. WILSON.....Best marksman.

Gold Medal, Lieut. J. S. Grisard.

GRENVILLE LEWIS.....Best drilled man in Manual of Arms.

Gold Medal, by E. G. Niles, Alumnus College, Class 1890.

Grateful acknowledgment is made to the following gentlemen for contributions to the better equipment of the College in its various departments.

1. Gov. Frank Brown, Piano, Books and Picture.

2. Senator A. P. Gorman, for Governmental Publications from various departments.

3. Representative Chas. E. Coffin, for Governmental Publications and a very valuable set of Shorthorn Herd Books, English and American editions.

4. A. M. Fulford, for sets of Breeder's Gazette, Country Gentleman, National Live Stock Journal, The American Farmer.

5. S. S. Buckley, Class '93, for sets of Thackery, 10 volumes; Ruskin, 7 volumes; Scott, 12 volumes; Dickens, 15 volumes; Irving, 6 volumes.

6. Mayor and City Council of Baltimore, for a twenty-five horse-power engine, for the Mechanical Building.

7. The Country Press, for their papers to our Reading Room.

8. E. G. Niles, Class '90, for the contribution of a Gold Medal, for excellence in Manual of Arms.

9. The following firms for contributing to the equipment of our Mechanical and Engineering Department :

The Lodge-Davis Machine Tool Co., Cincinnati, O.

Pennsylvania Iron Works, Philadelphia, Pa.

Burnham Williams & Co., Philadelphia.

Walker Manufacturing Co., Cleveland, O.

King Bridge Co., Cleveland, O.

Berlin Iron Bridge Co., East Berlin, Conn.

Youngstown Bridge Co., Youngstown, O.

Harrisburg Machine Co., Harrisburg, Pa.

Worthington Steam Pumping Engine Co., New York.

Holly Manufacturing Co., Lockport, N. Y.

Toledo Bridge Co., Toledo, O.

The following members of classes of the Alumni have been located.
Any information leading to further additions will be gratefully received.

CLASS 1895.

Joseph G. Bannon, B. S.
Barnes Compton, Jr., B. S.
George S. Edelen, B. S.
Samuel H. Harding, B. S.
Henry C. Jones, B. S.
Curtis C. McDonnell, B. S.
William W. Skinner, B. S.
John J. Timanus, B. S.

Guyger H. Clagett, B. S.
William B. Crapster, B. S.
Harry R. Graham, B. S.
Roland L. Harrison, B. S.
Lindsay McCandlish, B. S.
Clarence S. Mullikin, B. S.
Richard E. Sliger, B. S.
George W. Wilson, Jr., B. S.

CLASS 1894.

Franklin B. Bomberger, B. S.
Arthur S. Brown, B. S.
Howard M. Dent, B. S.
Sothoron Key, B. S.
Mervin T. Sudler, B. S.

Hezekiah Best, B. S.
Chas. W. Cairnes, B. S.
Thomas E. Foran, B. S.
Richard R. Pue, B. S.
Clay H. Weimer, B. S.

CLASS 1893.

Chas. H. Alvey, B. S.
S. S. Buckley, B. S.
G. Y. Graff, B. S.
J. W. Lawson, B. S.
H. C. Sherman, B. S.

CLASS 1892.

F. W. Besley, B. S.
J. D. Brooks, B. S.
G. H. Calvert, B. S.
F. Chew, B. S.
Norton Childs, B. S.
S. W. Gambrill, B. S.
E. D. Johnson, B. S.
J. E. Ray, B. S.

CLASS 1891.

Chas. Branch, B. S.
J. C. Langley, B. S.
J. B. Latimer, B. S.
S. N. Penn, B. S.
F. P. Veitch, B. S.

CLASS 1890.

W. S. Keech, B. S.
E. G. Niles, B. S.
R. L. Russell, B. S.
C. E. Soles, B. S.

CLASS 1883.

R. B. B. Chew, B. S.
Wm. T. Kerby, B. S.
E. E. Ripley, B. S.

CLASS 1882.

P. A. Bowen, B. S.
Lieut. H. Freeland, B. S.
Lieut. Saunders, B. S.

CLASS 1881.

Dr. H. E. Gale, B. S.
Richard Mercer, B. S.

CLASS 1878.

Wm. Thomas.

CLASS 1877.

Truxton Houston, B. S.
Edward Emack, B. S.
R. H. Beall, B. S.
Geo. Thomas, B. S.

CLASS 1876.

J. T. Blair, B. S.
T. H. Thomas, B. S.
J. L. Worthington, B. S.

CLASS 1889.

R. C. M. Calvert, B. S.
 R. M. Pindell, B. S.
 N. R. Sanlbury, B. S.
 Frank Witmer, B. S.

CLASS 1888.

S. M. Chamblers, B. S.
 M. C. Hazen, B. S.
 L. B. Johnson, B. S.
 R. E. Smith, B. S.
 A. C. Tolson, B. S.
 J. B. Weems, B. S.

CLASS 1875.

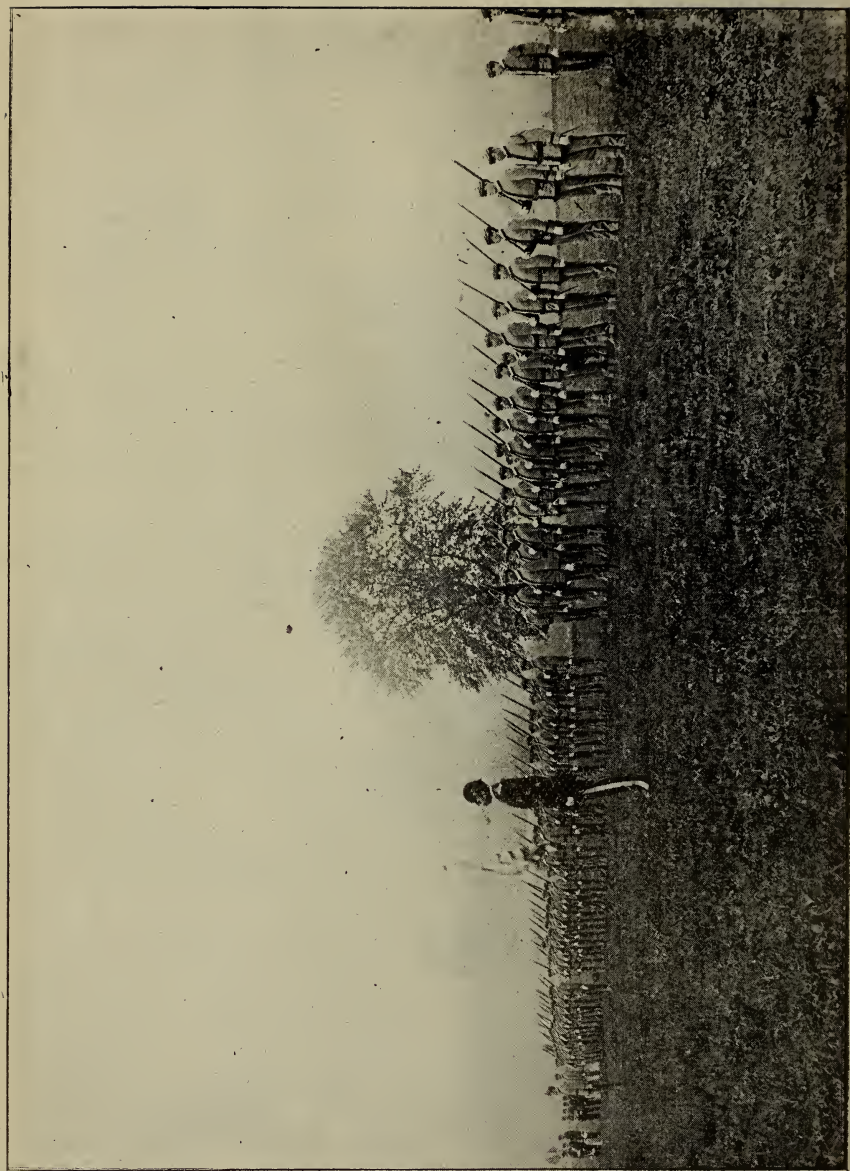
J. B. Gray, B. S.
 J. B. Hyde, B. S.
 Charles E. Lerch, B. S.
 Lorion Miller, B. S.

CLASS 1874.

L. A. Griffith, B. S.
 J. W. Caffrin, B. S.
 H. M. Davis, B. S.
 F. C. Norwood, B. S.

CLASS 1863.

W. B. Sands, B. S.
 Chas. B. Calvert, B. S.



BATTALION OF CADETS.

Some Rules for the Information of the Patrons of the College:

1. We presume that you have examined the rules and regulations of this Institution. If you have decided to become a patron of the same, we earnestly ask your co-operation in having these laws maintained.

2. Do not ask the suspension of a regulation for the individual case of your son or ward. We cannot comply with your request if made.

3. All cadets are required to wear uniforms. The College makes a contract with some reputable firm, and obtains the same upon very favorable terms, cap, coat and pants this year costing \$14.39.

4. There are four courses of instruction:

- (1) Agricultural.
- (2) Mechanical.
- (3) Scientific.
- (4) Classical.

A student on entering, either decides for himself, or his parent or guardian determines for him, which of these courses he will pursue. This decision must be final, for changes are inimical to progress and must be avoided.

5. All cadets furnish themselves with the following articles from the Quartermaster's department, or secure them elsewhere. They must be uniform in shape, color, etc:

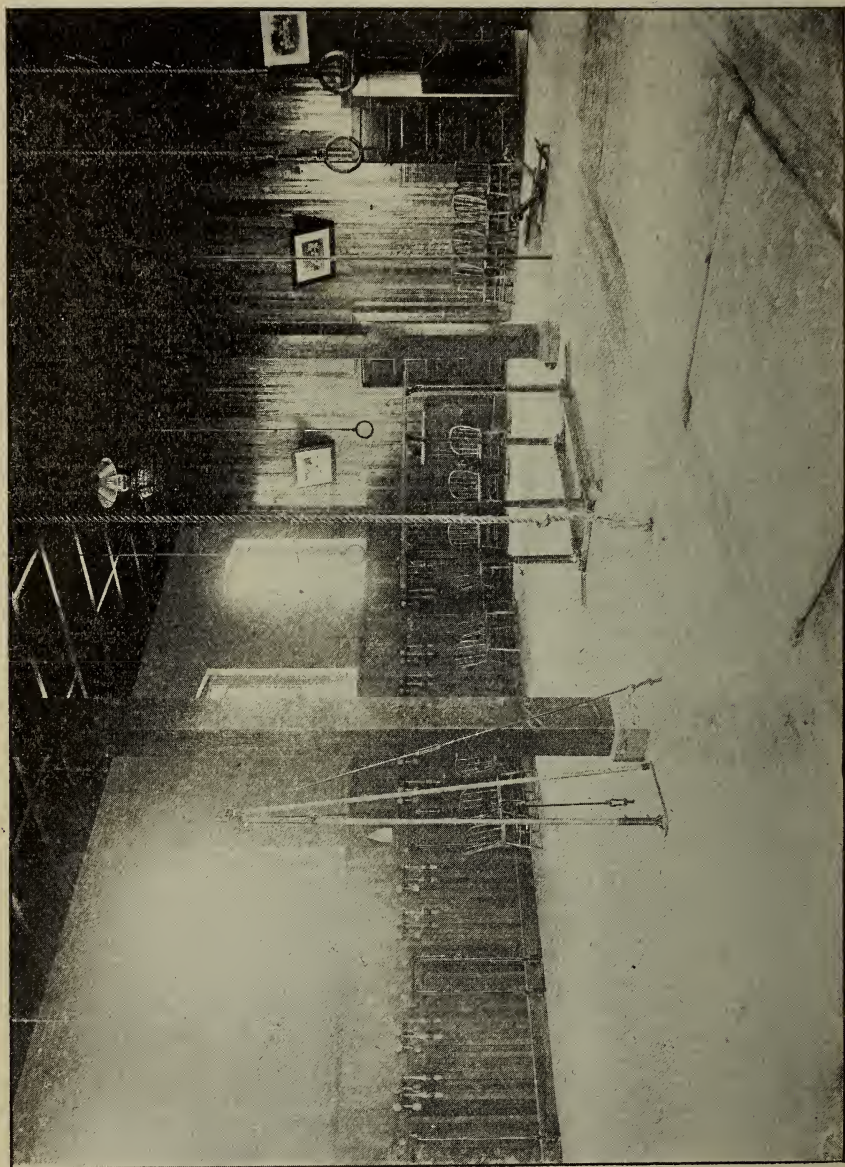
- 1 dozen white collars, uniform.
- 6 pair white gloves, uniform.
- 6 " " cuffs, "
- 1 pair blankets, need not be uniform.
- 3 " sheets " " "
- 3 pillow cases, need not be uniform.
- 1 " " uniform.
- 2 blue spreads of uniform pattern.
- 6 towels.
- 1 chair, uniform.

The room-mates together purchase the following articles:

- 1 set lamp fixtures, uniform.
- 1 pitcher and basin "
- 2 table cloths. "
- 1 Broom. "
- 1 looking-glass. "
- 1 slop bucket. "
- 1 Blacking box cupboard, uniform.

The expense of this outfit should not be more than \$10.00, and when once procured should last, with few exceptions, for the four years of a complete course.

6. Each cadet deposits on entrance \$5.00 at the beginning of each year. The fund so created is to offset all individual injury to property, and in case the guilty party cannot be located the injury done will be charged to the whole school. At the end of the year any balance left is returned to the depositors. During the past year this check has been productive of much good. Little destruction of property has taken place.



A CORNER IN THE GYMNASIUM.

7. All money and valuables should be deposited with the Treasurer. The College can only be responsible when this is done.

OTHER EXPENSES.

All cadets working in practical laboratories pay \$6.00 for material used.

A medical fee of \$4.00 is required of every Boarding cadet. This in case of sickness, covers all expenses for attendance and medicine, unless consultation or surgery is required, or professional nursing.

Pay students expenses are \$140.00 for the nine months. This includes books, washing, heat, gas, room furnished with articles not above enumerated, and instruction in every department of the college. Payments, \$40.00 on entrance; \$40.00 November 15th; \$40.00 February 1st, and \$20.00 April 1st.

Scholarship cadets are required to make the annual deposit, the laboratory fees, and \$22.50 on entrance, and \$22.50 on February 1st.

Day students pay laboratory fee, annual deposit, and \$12.00 on entrance, and \$12.00 February 1st.

Except in cases of protracted sickness no money will be refunded for absence or withdrawal from College.

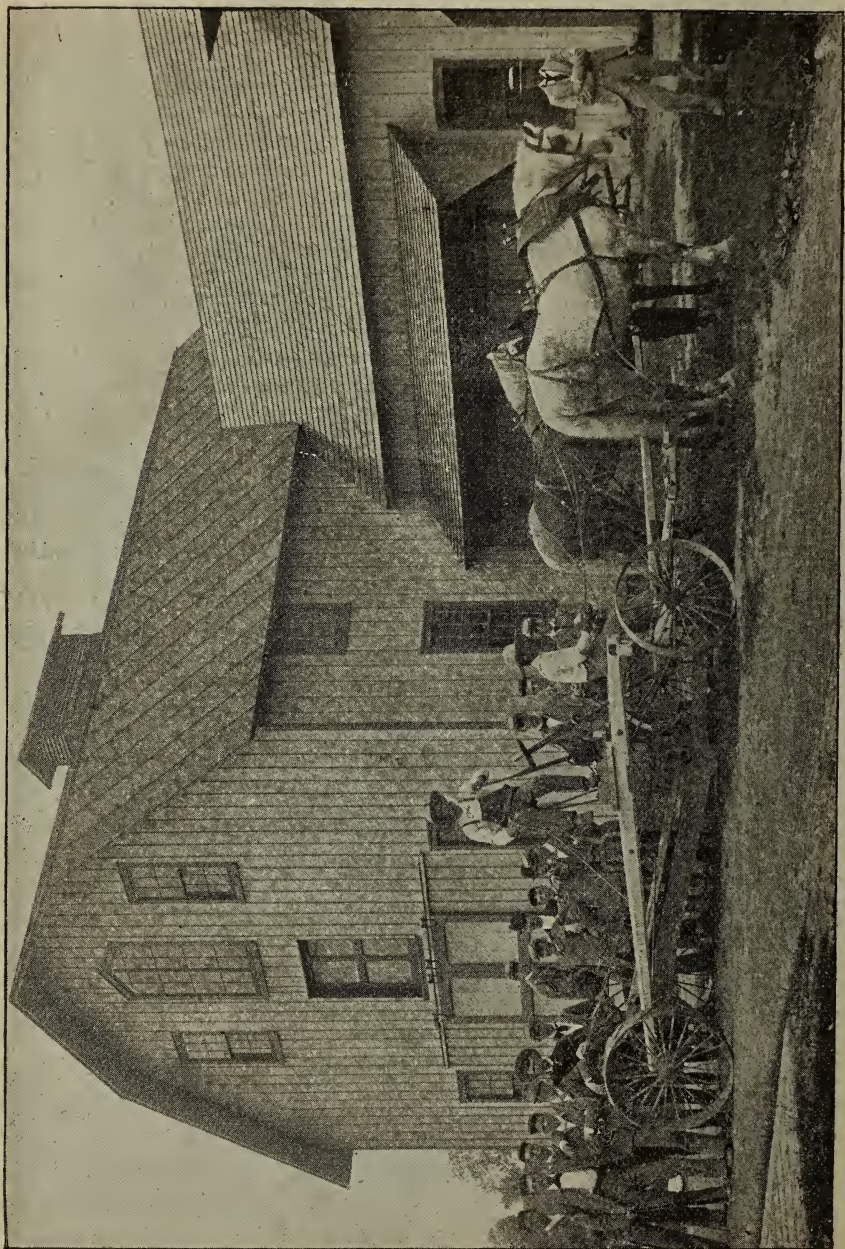
Payments must be made as the law requires. The sum charged is so small that it is only by the closest economy and prompt payment that the Domestic department is made self-supporting.

Please read carefully the above regulations, and if you can then subscribe to the same the Trustees will be pleased to have your son or ward, and do all they can for his mental, moral and physical development.

Official correspondence should be addressed to the President.

For any further particulars address,

	R. W. SILVESTER,
Express Office,	President Maryland Agricultural College,
College, B. & O. R. R.	College Park, Maryland.



DITCHING MACHINE OF EXPERIMENT STATION.

REPORT OF THE EASTERN BRANCH OF THE MARYLAND AGRICULTURAL COLLEGE.

FOR THE YEAR ENDING JUNE 30TH, 1895.

PRINCESS ANNE, SOMERSET CO., MD.
PRESIDENT R. W. SILVESTER,

Maryland Agricultural College :

DEAR SIR:—In accordance with instructions, I have the honor to transmit herewith the report of the Princess Anne Academy, the Eastern Branch of the Maryland Agricultural College, for the year ending June 30th, 1895.

Attention to Agriculture and the Mechanic Arts has been fully emphasized and observed. Students are required to devote at least one hour daily, and a half a day on Saturdays, to this important part of the course of training. A broad and thorough English course has been successfully pursued under the direction of competent instructors.

Besides the work done on the farm, the young men have received practical instruction in Blacksmithing, Bricklaying, Carpentry, Shoemaking, Tailoring and Printing, while the young women have been trained in Cooking, Laundrying, Dressmaking and practical household duties.

Habits of industry and self-help have been encouraged by giving students the preference to do the extra work on the farm, to care for the buildings and grounds, for which a fair compensation has been allowed. The entire expense per year does not exceed \$70, which entitles the student to all the advantages of the Institution, including board, washing, etc.

Notwithstanding the financial depression, so generally felt by all classes, the number of students continues to increase, and the Institution to grow in popularity, as its work becomes better known. The greatest need of the Institution is a building to properly accommodate the trades; and could the generosity of the friends of the school be supplemented by aid from the State, the work would be greatly strengthened and permanently benefitted.

THE ACADEMY FARM.

The farm has been considerably improved by ditching, fencing and careful cultivation. Of the 121 acres contained in the farm, 90 are admirably adapted to the growth of grain, grass, vegetables and small fruits. Facilities for instruction and practice in practical farming and gardening, embracing implements, stock and material, have been added as the requirements demanded.

BLACKSMITHING.

The work done in this department has been making chains, tools, hooks, rings, staples, nails, hinges and horse shoes; also horse-shoeing, repairing farm implements, ironing new implements, etc.

CARPENTRY.

The principal need in this department is more room. Tools and material have been added during the year, and the interest is quite marked—more young men applying for this trade than any other. Instruction in making tables, benches, ironing-boards, farming implements, also framing, flooring, roofing, etc., have been given with very satisfactory results.

SHOEMAKING.

The equipment in this department is fair, and the work done is very good. The instruction here consists in repairing old work and making new shoes, and also in harness-making.

BRICKLAYING.

This trade is pursued during the greater part of the winter under difficulties, but, notwithstanding, valuable instruction in paving, building walls, forges, chimneys, etc., has been given.

TAILORING.

Considerable interest has been manifested in this department, in the instruction given in repairing, scouring and cleaning old work, and in cutting, fitting and making new garments.

PRINTING.

This is a new industry, in which considerable interest was taken from the start. It promises to be the means of saving expense to the institution, and at the same time, a great benefit to the students.

HOUSEHOLD DEPARTMENT.

The importance of this department becomes more apparent every year. The applications for young women who are competent to take charge of the affairs of the well regulated home, are far in excess of the supply. All the girls received practical instruction in cooking, laundry, sewing and general household duties.

Very respectfully submitted,

B. O. BIRD,

Principal and Superintendent.

FACULTY OF INSTRUCTION.

B. O. BIRD.—Principal and Superintendent of Agricultural and Industrial Department—English studies.

MRS. PORTIA E. BIRD.—Assistant Superintendent of Girls' Industrial Department—English studies.

JACOB C. DUNN, Mathematics.

MRS. JESSE E. WATERS, English studies.

MRS. LAURA A. PULLETT, English studies.

MARTHA V. WATERS, Tailoring.

JOSEPH N. WIBBONS, Blacksmithing.

GEORGE E. LLOYD, Masonry.

JOSEPH P. JOYNES, Carpentry.

JAMES MILLS, Shoemaking.

JACOB B. BROWN, Farming.

LEWIS N. FRISBY, Printing.

GRADUATES, 1894.

Isaac J. B. Dennis,

Walter J. Moore,

Annie V. Riley,

H. Alverta Waters,

Anna V. Greene,

Joseph Hayman,

Estelle L. Stansberry.

Ella F. Horsey,

R. H. W. Pinkett,

J. H. S. Waters,

Estena V. White.

GRADUATES, 1895.

Dennis W. Noble,

Bessie E. Maddox.

Effie J. Miles,

Mary C. Riley,

Laura A. Pullett,

Cassid Mousserone.

Hulet E. Morris.

A List of Students Enrolled During Callendar Year, 1895

SENIOR CLASS.

Brittingham, Gertrude A	Easton, Md.
Brittingham, Lavinia.....	Easton, Md.
Brown, Robert I.....	Washington, D. C.
Cottman, Elizabeth C.....	Oriole, Md.
Coursey, Rachel L.....	Smyrna, Del.
Dennis, I. J. B.....	Pittsburg, Pa.
Dennis, Bertha S.....	Princess Anne Md.
Dennis, Thomas H.....	Princess Anne, Md.
Gaither, Ernest R.....	Montclair, N. J.
Hayman, Joseph.....	Princess Anne, Md.
Horsey, Ella F.....	Princess Anne, Md.
Howard, James H.....	Unity, Md.
Maddox, Bessie E	Oriole, Md.
Miles, Effie J.....	Crisfield, Md.
Miles, Addie M.....	Crisfield, Md.
Moore, Walter J.....	Princess Anne, Md.
Morris, Hulet E.....	Princess Anne, Md.
Morris, Harry S.....	Princess Anne, Md.
Mouserone, Cassie M.....	Jamaica, N. Y.

Noble, Dennis W.....	Allen, Md.
Pullett, Laura A.....	Vienna, Md.
Purnell, Harry W. S.....	Snow Hill, Md.
Riley, Mary C.....	Centreville, Md.
Smith, Irving L.....	Baltimore, Md.
Waters, Alfred G.....	Princess Anne, Md.
Waters, John S. H.....	Mt. Vernon, Md.
Waters, J. Addison.....	Pocomoke, Md.

MIDDLE CLASS.

Boggs, Robert N.....	Fairmount, Md.
Bowland, William C.....	Princess Anne, Md.
Brown Edward H.....	Washington, D. C.
Cottman, Samuel J.....	Princess Anne, Md.
Coulborne, Elizabeth.....	Marion, Md.
Dennis, Henrietta A.....	Marion, Md.
Dennis, William H.....	Marion, Md.
Dixon, Annie M.....	Deal's Island, Md.
Gale, William L.....	Princess Anne, Md.
Hawkins, Charles H.....	Down's Chapel, Del.
Hawkins, Clara C.....	Baltimore, Md.
Hawkins, Nannie B.....	Baltimore, Md.
Hensley, Samuel T.....	Baltimore, Md.
Horner, Minnie L.....	Federalsburg, Md.
Hutchins, Laura V.....	E. New Market, Md.
Joynes, Joseph P.....	Jamestown, Md.
King, Nellie E.....	Princess Anne, Md.
Moore, Sarah C.....	Princess Anne, Md.
Nutter, Hattie D.....	Princess Anne, Md.
Pierce, Rutherford H.....	Bridgetown, N. J.
Riley, Sarah S.....	Chester, Pa.
Shockley, Cora V.....	Salisbury, Md.
St. Clair, Chauncey.....	Montclair, N. J.
Still, John N.....	Cramer Hill, N. J.
Suter, Mary M.....	Baltimore, Md.
Tilghman, Sarah E.....	Deal's Island, Md.
Waters, Lily M.....	Wilmington, Del.
Waters, Martin V.....	Princess Anne, Md.
Waters, Evelyn U.....	Mt. Vernon, Md.
Waters, Eleanor.....	Mt. Vernon, Md.
Whittington, Hattie J.....	Philadelphia, Pa.

FIRST CLASS.

Ballard, Sandy M.....	Princess Anne, Md.
Bird, Oliver W.....	Princess Anne, Md.
Brown, Thomas H.....	Still Pond, Md.
Dell, Clara A.....	New York, N. Y.
Dennis, Samuel J.....	Princess Anne, Md.
Heitman, Henry G.....	Westville, Conn.
Hudson, George W.....	Nassau, Del.

Jackson, Thomas H.....	Montclair, N. J.
Jackson, Annie.....	Princess Anne, Md.
Jefferson, John W.....	Baltimore, Md.
Johnson, Cornelia.....	Philadelphia, Pa.
Joynes, Mattie E.....	Onancock, Va.
King, Laura.....	Princess Anne, Md.
King, Leonard J.....	Princess Anne, Md.
King, Stephen.....	Princess Anne, Md.
Lee, Alonzo J.....	Still Pond, Md.
Morris, Nettie.....	Princess Anne, Md.
Moore, Mary R.....	Princess Anne, Md.
McNitt, Ashburn.....	Wilmington, Del.
Nickens, William W.....	Montclair, N. J.
Nickens, Emma J.....	Montclair, N. J.
Norwood, Beatrice.....	Nassau, Del.
Peaker, Emma.....	Galena, Md.
Powell, Richard.....	Baltimore, Md.
Roles, Alexander R.....	Baltimore, Md.
Roberts, Virginia.....	Baltimore, Md.
Spencer, Estelle C.....	Wilmington, Del.
Tibbs, Thomas G.....	Montclair, N. J.
Trader, Minos A.....	Salisbury, Md.
Tyler, Dora.....	Deal's Island, Md.
Teagle, Leah U.....	Brooklyn, N. Y.
Watts, Beulah.....	Philadelphia, Pa.
Waters, Ida E.....	Oriole, Md.

PREPARATORY DEPARTMENT.

Bird, Irma A.....	Princess Anne, Md.
Bird, Portia E.....	Princess Anne, Md.
Bird, Viola R.....	Princess Anne, Md.
Bird, James N.....	Princess Anne, Md.
Bird, Benjamin I.....	Princess Anne, Md.
Brown, Lottie.....	Princess Anne, Md.
Carroll, Jennie.....	Princess Anne, Md.
Carroll, William.....	Westover, Md.
Campbell, Eugene.....	Atlantic City, N. J.
Carter, Sarah M.....	New York, N. Y.
Cottman, Susan.....	Princess Anne, Md.
Dennis, Thomas W.....	Princess Anne, Md.
Dickerson, Charles.....	Pocomoke, Md.
Dorman, James.....	Princess Anne, Md.
Donaho, Cornelia R.....	Eden, Md.
Ford, Wesley S.....	Burlington, N. J.
Gale, Sarah.....	Princess Anne, Md.
Gooding, Margaret.....	Wilmington, Del.
Handy, Samuel B.....	Salisbury, Md.
Hayman, Ella.....	Princess Anne, Md.
Houke, Martha E.....	Charlestown, W. Va.
Johnson, William.....	Princess Anne, Md.

Johnson, Sarah.....	Princess Anne, Md.
Johnson, Rosa.....	Atlantic City, N. J.
King, Thomas H.....	Baltimore, Md.
King, Elizabeth.....	Princess Anne, Md.
Lynn, George J.....	Princess Anne, Md.
Maddox, Walter.....	Princess Anne, Md.
Moore, Albert P.....	Princess Anne, Md.
Moore, Walter E.....	Princess Anne, Md.
Nutter, Sarah L.....	Burlington, N. J.
Quann, Florence.....	Mt. Holly, N. J.
Spencer, Ursa.....	Benson, Md.
Tilghman, William H.....	Princess Anne, Md.
Valentine, Charles.....	Montclair, N. J.
Waters, Mary E.....	Wilmington, Del.
Wise, Elisabeth.....	Wattsville, Va.
Wright, Francis.....	Princess Anne, Md.
Zuhlacke, Edward C.....	Crisfield, Md.

APPENDICES.

As there appears to exist among the people of the State no little confusion and misconception in regard to the respective functions of the Agricultural College and of the Experiment Station, it has been thought advisable to add to this Report, as appendices, A B and C, the several Acts of Congress making appropriations for and governing agricultural colleges and experiment stations; and as appendix D, the fertilizer law of Maryland. As appendix E, has been added a table showing the foundations and incomes of the "Land Grant" colleges.

APPENDIX A.

THE LAND GRANT ACT.

Public Laws of the United States, 1862, Chapter 130.

[The College receives from the sale of the land scrip apportioned to Maryland, by this Act, a permanent income of \$6,142 30. It will be noted that this income can be used only for specific purposes designated in the Act.]

AN ACT donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there be granted to the several States, for the purpose hereinafter mentioned, an amount of public land, to be apportioned to each State a quantity equal to thirty thousand acres for each Senator and Representative in Congress to which the States are respectively entitled by the apportionment under the census of eighteen hundred and sixty; *Provided,* That no mineral lands shall be selected or purchased under the provisions of this act.

§ 2. *And be it further enacted,* That the land aforesaid, after being surveyed, shall be apportioned in the several States in sections or subdivisions of sections, not less than one-quarter of a section; and whenever there are public lands in a State subject to sale at private entry at one dollar and twenty-five cents per acre, the quantity to which said State shall be entitled shall be selected from such lands within the limits of such State, and the Secretary of the Interior is hereby directed to issue to each of the States in which there is not the quantity of public lands subject to sale at private entry at one dollar and twenty-five cents per acre, to which said State may be entitled under the provisions of this act, land scrip to the amount in acres for the deficiency of its distributive share; said scrip to be sold by said State and the proceeds thereof applied to the uses and purposes prescribed in this act, and for no other use or purpose whatsoever; *Provided,* That in no case shall any State to which land scrip may thus be issued be allowed to locate the same within the limits of any other State, or of any Territory of the United States, but their assignees may thus locate said land scrip upon any of the unappropriated lands of the United States subject to sale at private entry at one dollar and twenty-five cents, or less, per acre; *And provided further,* That not more than one million acres shall be located by such assignees in any one of the States; *And provided further,* That no such location shall be made before one year from the passage of this act.

§ 3. *And be it further enacted,* That all the expenses of management, superintendence and taxes from date of selection of said lands, previous to their sales, and all expenses incurred in the management and disbursement of the moneys which may be received therefrom, shall be paid by the States to which they may belong, out of the treasury of said States, so that the entire proceeds of the sale of said lands shall be applied without any diminution whatever to the purposes hereinafter mentioned.

§ 4. *And be it further enacted*, That all moneys derived from the sale of lands aforesaid by the States to which the lands are apportioned, and from the sales of land scrip hereinbefore provided for, shall be invested in stocks of the United States, or of the States, or some other safe stocks, yielding not less than five per centum upon the par value of said stocks; and that the moneys so invested shall constitute a perpetual fund, the capital of which shall remain forever undiminished, (except so far as may be provided in section fifth of this act,) and the interest of which shall be inviolably appropriated, by each State which may take and claim the benefit of this act, to the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the State may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.

§ 5. *And be it further enacted*, That the grant of land and land scrip hereby authorized shall be made on the following conditions, to which, as well as to the provisions hereinbefore contained, the previous assent of the several States shall be signified by legislative acts:

First. If any portion of the fund invested, as provided by the foregoing section, or any portion of the interest thereon shall, by any action or contingency, be diminished or lost, it shall be replaced by the State to which it belongs, so that the capital of the fund shall remain forever undiminished; and the annual interest shall be regularly applied without diminution to the purposes mentioned in the fourth section of this act, except that a sum, not exceeding ten per centum upon the amount received by any State under the provisions of this act, may be expended for the purpose of lands for sites or experimental farms whenever authorized by the respective legislatures of said State.

Second. No portion of said fund, nor the interest thereon, shall be applied, directly or indirectly, under any pretense whatever, to the purchase, erection, preservation, or repair of any building or buildings.

Third. Any State which may take and claim the benefit of the provisions of this act, shall provide, within five years at least, not less than one college, as described in the fourth section of this act, or the grant to such State shall cease; and said State shall be bound to pay to the United States the amount received of any lands previously sold, and that the title to purchasers under the State shall be valid.

Fourth. An annual report shall be made regarding the progress of each college, recording any improvements and experiments made, with their costs and results, and such other matters, including State industrial and economical statistics, as may be supposed useful; one copy of which shall be transmitted by mail free, by each, to all the other colleges which may be endowed under the provisions of this act, and also one copy to the Secretary of the Interior.

Fifth. When lands shall be selected from those which have been raised to double the minimum price, in consequence of railroad grants,

they shall be computed to the States at the maximum price, and the number of acres proportionally diminished.

Sixth. No State while in a condition of rebellion or insurrection against the government of the United States shall be entitled to the benefit of this act.

Seventh. No State shall be entitled to the benefits of this act unless it shall express its acceptance thereof by its legislature within two years from the date of its approval by the President.

§ 6. *And be it further enacted*, That land scrip issued under the provisions of this act shall not be subject to location until after the first day of January, one thousand eight hundred and sixty-three.

§ 7. *And be it further enacted*, That the land officers shall receive the same fees for locating land scrip issued under the provisions of this act as is now allowed for the location of military bounty land warrants under existing laws; *Provided*, their maximum compensation shall not be hereby increased.

§ 8. *And be it further enacted*, That the Governors of the several States to which scrip shall be issued under this act shall be required to report annually to Congress all sales made of such scrip until the whole shall be disposed of, the amount received for the same, and what appropriation has been made of the proceeds.

APPROVED, July 2, 1862.

APPENDIX B.

THE HATCH ACT.

[By resolution of the Board of Control of the Maryland Agriculture College, adopted July 14th, 1892, the College and Experiment Station were placed under separate executive officers, and the annual appropriation of \$15,000, carried by the "Hatch Act," was devoted entirely to the Experiment Station. The College receives no part of it.]

AN ACT to establish agricultural experiment stations in connection with the colleges established in the several States under the provisions of an act approved July second, eighteen hundred and sixty-two, and of the acts supplementaîy thereof.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science, there shall be established, under direction of the college or colleges or agricultural department of colleges in each State or Territory established, or which may hereafter be established, in accordance with the provisions of an act approved July second, eighteen hundred and sixty-two, entitled "An act donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts," or any of the supplements to said act, a department to be known and designated as an "agricultural experiment station;" *Provided,* That in any State or Territory in which two such colleges have been or may be so established the appropriation hereinafter made to such State or Territory shall be equally divided between such colleges, unless the Legislature of such State or Territory shall otherwise direct.

SEC. 2. That it shall be the object and duty of said experiment station to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches and experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States or Territories.

SEC. 3. That in order to secure, as far as practicable, uniformity of methods and result in the work of said Stations, it shall be the duty of the United States Commissioner of Agriculture to furnish forms, as far

as practicable, for the tabulation of results of investigation or experiments, to indicate from time to time, such lines of inquiry as to him shall seem most important; and, in general, to furnish such advice and assistance as will best promote the purposes of this act. It shall be the duty of each of said Stations, annually, on or before the first day of February, to make to the Governor of the State or Territory in which it is located a full and detailed report of its operations, including a statement of receipts and expenditures, a copy of which report shall be sent to each of said Stations, to the Commissioner of Agriculture, and to the Secretary of the Treasury of the United States.

SEC. 4. That bulletins or reports of progress shall be published at said Stations at least once in three months, one copy of which shall be sent to each newspaper in the States or Territories in which they are respectively located, and to such individuals actually engaged in farming as may request the same, and as far as the means of the Station will permit. Such bulletins or reports and the annual reports of said Stations shall be transmitted in the mails of the United States free of charge for postage, under such regulations as the Postmaster-General may from time to time prescribe.

SEC. 5. That for the purpose of paying the necessary expenses of conducting investigations and experiments and printing and distributing the results as hereinbefore prescribed, the sum of fifteen thousand dollars per annum is hereby appropriated to each State, to be specially provided for by Congress in the appropriations from year to year, and to each Territory entitled under the provisions of section eight of this Act, out of any money in the Treasury proceeding from the sales of public lands, to be paid in equal quarterly payments, on the first day of January, April, July and October of each year, to the treasurer or other officer duly appointed by the governing boards of said colleges to receive the same, the first payment to be made on the first day of October, eighteen hundred and eighty-seven: *Provided, however,* That out of the first annual appropriation so received by any Station an amount not exceeding one-fifth may be expended in the erection, enlargement, or repair of a building or buildings necessary for carrying on the work of such Station; and thereafter an amount not exceeding five per centum of such annual appropriation may be expended.

SEC. 6. That whenever it shall appear to the Secretary of the Treasury from the annual statement of receipts and expenditures of any of said Stations that a portion of the preceding annual appropriation remains unexpended, such amount shall be deducted from the next succeeding annual appropriation to such Station, in order that the amount of money appropriated to any Station shall not exceed the amount actually and necessarily required for its maintenance and support.

SEC. 7. That nothing in this Act shall be construed to impair or modify the legal relations existing between any of the said Colleges and the government of the States or Territories in which they are respectively located.

SEC. 8. That in States having colleges entitled under this section to the benefits of this Act and having also Agricultural Experiment

Stations established by law separate from said Colleges, such States shall be authorized to apply such benefits to experiments at stations so established by such States; and in case any State shall have established, under the provisions of said Act of July 2, aforesaid, an Agricultural Department or Experiment Station, in connection with any University, College or institution not distinctively an Agricultural College or school, and such State shall have established or shall hereafter establish a separate Agricultural College or School, which shall have connected therewith an experimental farm or Station, the Legislature of such State may apply in whole or in part the appropriation by this Act made, to such separate Agricultural College or school, and no Legislature shall by control express or implied disable itself from so doing.

SEC. 9. That the grants of moneys authorized by this Act are made subject to the legislative assents of the several States and Territories to the purposes of said grant: *Provided*, That payment of such installments of the appropriation herein made as shall become due to any State before the adjournment of the regular session of its Legislature meeting next after the passage of this Act shall be made upon the assent of the Governor thereof duly certified to the Secretary of the Treasury.

SEC. 10. Nothing in this Act shall be held or construed as binding the United States to continue any payments from the Treasury to any or all the States or Institutions mentioned in this Act, but Congress may at any time amend, suspend or repeal any or all the provisions of this Act.

Approved March 2, 1887.

APPENDIX C.

THE SECOND MORRILL ACT.

[To meet the provisions of this Act requiring an equitable division of the appropriation which it carries between white and colored students, one-fifth of the revenue derived from this source is set aside for the use of the Eastern Branch of the College at Princess Anne, in Somerset county. It will be noted that, as in the Land-Grant Act, the revenue derived by the College from the Second Morrill Act, can be used only for specific purposes designated in the Act.]

AN ACT to apply a portion of the proceeds of the public lands to the more complete endowment and support of the Colleges for the benefit of agriculture and the mechanic arts established under the provisions of an Act of Congress approved July 2, eighteen hundred and sixty-two.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be, and hereby is annually appropriated, out of any money in the Treasury not otherwise appropriated, arising from the sales of public lands, to be paid as hereinafter provided, to each State and Territory for the more complete endowment and maintenance of Colleges for the benefit of agriculture and the mechanic arts now established, or which may hereafter be established, in accordance with an Act of Congress approved July second, eighteen hundred and sixty-two, the sum of fifteen thousand dollars for the year ending June 30th, eighteen hundred and ninety, and an annual increase of the amount of such appropriation thereafter for ten years by an additional sum of one thousand dollars over the preceding year, and the annual amount to be paid thereafter to each State and Territory shall be twenty-five thousand dollars to be applied only to instruction in agriculture, the mechanic arts, the English language and the various branches of mathematical, physical, natural and economic science, with special reference to their applications in the industries of life, and to the facilities for such instruction: *Provided,* That no money shall be paid out under this act to any State or Territory for the support and maintenance of a college where a distinction of race or color is made in the admission of students, but the establishment and maintenance of such colleges separately for white and colored students shall be held to be a compliance with the provisions of this act if the funds received in such State or Territory be equitably divided as hereinafter set forth: *Provided,* That in any State in which there has been one college established in pursuance of the act of July second, eighteen hundred and sixty-two, and also in which an educational institution of like character has been established, or may be hereafter established, and is now aided by such State from its own revenue, for the education of colored students in agriculture and the mechanic arts, however named or styled, or whether or not it has received money heretofore under the act to which this act is an amendment, the Legislature of such State may propose and report to the Secretary of the Interior a just and equitable division of the fund to be received under this act between one college for white students and one institution for colored students established as aforesaid, which shall

be divided into two parts and paid accordingly, and thereupon such institutions for colored students shall be entitled to the benefits of this act and subject to its provisions, as much as it would have been if it had been included under the act of eighteen hundred and sixty-two, and the fulfilment of the foregoing provisions shall be taken as a compliance with the provision in reference to separate colleges for white and colored students.

SEC. 2. That the sums hereby appropriated to the States and Territories for the further endowment and support of colleges shall be annually paid on or before the thirty-first day of July of each year, by the Secretary of the Treasury, upon the warrant of the Secretary of the Interior, out of the Treasury of the United States, to the State or Territorial Treasurer, or to such officer as shall be designated by the laws of such State or Territory to receive the same, who shall, upon the order of the trustees of the colleges, or the institution for colored students, immediately pay over said sums to the treasurer of the respective colleges or other institutions entitled to receive the same, and such treasurers shall be required to report to the Secretary of Agriculture and to the Secretary of the Interior, on or before the first day of September of each year, a detailed statement of the amount so received and of its disbursement. The grants of money authorized by this act are made subject to the legislative assent of the several States and Territories to the purpose of said grants: *Provided*, That payments of such installments of the appropriation herein made as shall become due to any State before the adjournment of the regular session of Legislature meeting next after the passage of this act shall be made upon the assent of the Governor thereof, duly certified to the Secretary of the Treasury.

SEC. 3. That if any portion of the moneys received by the designated officers of the State or Territory for the further and more complete endowment, support, and maintenance of colleges, or of institutions for colored students, as provided in this act, shall, by any action or contingency, be diminished or lost, or be misapplied, it shall be replaced by the State or Territory to which it belongs, and until so replaced no subsequent appropriation shall be apportioned or paid to such State or Territory; and no portion of said moneys shall be applied, directly, or indirectly, under any pretense whatever, to the purchase, erection, preservation, or repair of any building or buildings. An annual report by the president of each of said colleges shall be made to the Secretary of Agriculture, as well as to the Secretary of the Interior, regarding the condition and progress of each college, including statistical information in relation to its receipts and expenditures, its library, the number of its students and professors, and also as to any improvements and experiments made under the direction of any experiment stations attached to said colleges, with their costs and results, and such other industrial and economical statistics as may be regarded as useful, one copy of which shall be transmitted by mail free to all other colleges further endowed under this act.

SEC. 4. That on or before the first day of July in each year, after the passage of this act, the Secretary of the Interior shall ascertain and certify to the Secretary of the Treasury as to each State and Territory whether it is entitled to receive its share of the annual appropriation for colleges, or of institutions for colored students, under this act, and the amount which thereupon each is entitled, respectively, to receive. If the Secretary of the Interior shall withhold a certificate from any State or Territory of its appropriation the facts and reasons therefor shall be reported to the President, and the amount involved shall be kept separate in the Treasury until the close of the next Congress, in order that the State or Territory may, if it should so desire, appeal to Congress from the determination of the Secretary of the Interior. If the next Congress shall not direct such sum to be paid it shall be covered into the Treasury. And the Secretary of the Interior is hereby charged with the proper administration of this law.

SEC. 5. That the Secretary of the Interior shall annually report to Congress the disbursements which have been made in all the States and Territories, and also whether the appropriation of any State or Territory has been withheld, and if so, the reason therefor.

SEC. 6. Congress may at any time amend, suspend, or repeal any or all of the provisions of this act.

Approved, August 30, 1890.

APPENDIX.

Particular attention is called to the following statement: "To President Atherton, of the State College of Pennsylvania, is due the thanks of the Institution for furnishing so valuable a presentation of facts. It is to be hoped that the members of the Legislature of Maryland will carefully ponder these facts, and do more for their State College."

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EXHIBITS SHOWING THE FINANCIAL CONDITION OF LAND-GRANT COLLEGES IN SEVERAL STATES, AND THE EXTENT OF APPROPRIATIONS MADE BY THE RESPECTIVE LEGISLATURES FOR THEIR MAINTENANCE.

TABLE I.—Plant.

	Proceeds of Land Grant.	AMOUNT EXPENDED FOR PLANT.								Total Cost of Plant.	Present Value of Plant.	SOURCES FROM WHICH COST OF PLANT WAS PROVIDED.				
		STILL UNSOLD.										APPROPRIATIONS AND GIFTS FROM				
		Acres.	Value.	Land.	Buildings.	Apparatus.	Machinery.	Library.	Miscellaneous.			U. S. Land Grant, Ex. Farms.	State.	County.	Town or County.	Individual.
Alabama	\$233,500 00			\$7,173 00	\$143,314 00	\$47,740 00	\$18,612 00	\$11,210 00	\$4,750 00	\$222,829 00		\$33,807 00 Morrill act, 1890, 17,540 00 Fees from students, 2,000 00	\$92,500 00	(a) \$4,320 00	(b) \$30,000 00	(Hatch fund) \$20,000 00
California	711,505 44										\$1,142,013 00					
Colorado	155,800 00	90,000		5,000 00	8,300 00	0,750 00	4,570 00	2,800 00	0,750 00	64,800 00	156,000 26					
Florida	243,000 00	None.			28,000 00	33,500 00		4,000 00		65,500 00		Morrill act, 1890, 15,000 00				
Georgia	422,238 00	1,500	\$115,000 00	55,000 00	325,000 00	(50 00)	2,000 00	50,500 00		484,000 00						
Illinois	340,000 00	None.		83,400 00	268,700 00	48,780 00	30,778 00	7,500 00	21,385 00	469,777 00		Morrill act, 1890, 25,000 00				
Indiana	500,105 10	11,100 00	14,029 62	10,000 00	40,000 00	10,000 00	12,000 00	12,000 00	12,000 00	12,000 00		125,000 00				
Iowa	505,927 35	None.		38,000 00	142,000 00	17,612 24	17,057 51	10,950 50	30,021 58	327,336 12		125,000 00				
Kansas	165,000 00	None.			18,734 45	14,900 40	8,041 84	1,500 36	4,700 00	47,580 32		Morrill act, 1890, 18,000 00				
Kentucky—Agr. and Mech. College of Kentucky	340,000 00	None.		7,000 00	31,383 36	2,070 43	3,046 75	3,046 75	3,046 75	40,540 35						
Louisiana	131,300 00	None.		11,000 00	26,750 12	32,494 72	5,420 10	9,258 86	94,280 00	178,203 80						
Maryland	210,000 00	None.		30,500 00	79,500 00	32,720 00	3,000 00	0,313 15	18,280 00	153,028 15		(a) 21,000 43				
Massachusetts—Massachusetts Agricultural College	407,400 80			49,570 00	271,000 00	13,275 06	15,803 01	10,925 10	134,233 01	530,741 41						
Michigan	450,000 00	1,850		61,000 00	330,573 14	6,545 40	10,205 70	4,704 07		459,128 36						
Minnesota	3,911 50	None.		19,118 88	138,138 34	26,000 50	7,200 77	3,111 00	22,412 38	216,511 50						
Mississippi—Miss. Agr. and Mech. College	114,572 00	None.		42,500 00	100,000 00	10,437 52	11,103 71	12,550 00	3,100 72	170,000 00						
Missouri	317,000 00	35,000 00	80,508 40													
Nebraska	80,000 00															
Nevada																
New Hampshire																
New York	473,402 87	158,121 21	1,005,000 00	99,083 01	1,342,808 85	278,850 18	141,950 48	283,061 00	49,725 00	2,108,588 42						
North Dakota	900,000 00	10,000	10,000 00	10,000 00	30,500 00	2,089 08	853 08	1,084 18		51,728 31						
Ohio	524,175 62			118,115 00	424,457 07	10,114 30	9,507 08	19,800 00		642,045 05						
Pennsylvania	427,200 50			50,886 50	376,314 00	52,404 04	20,728 01	15,044 30	361 00	684,244 86						
Rhode Island—Brown University	50,000 00	None.		320,000 00	200,000 00	5,315 00	5,315 00	5,315 00	5,315 00	1,143,800 00						
Rhode Island—Agricultural Experiment Station	7,400 00	None.		7,400 00	8,100 00	8,100 00	8,100 00	8,100 00	8,100 00	32,700 00						
South Carolina	120,000 00	(a) 1,200,000 00		8,000 00	81,500 00	6,000 00	2,000 00	3,000 00	3,000 00	100,000 00						
South Dakota	307,000 00			225,000 00	25,500 00	25,500 00	25,500 00	25,500 00	25,500 00	376,200 00						
Tennessee	183,500 00															
Vermont	90,000 00	None.		47,245 00	480,200 17	4,805 57	58,750 51	3,018 13	71,922 38	653,080 70						
West Virginia	85,500 00	None.														
Wisconsin	90,000 00	None.		14,717 00	145,788 00	15,035 00	888 00	8,087 97	22,228 00	217,641 97						
Wyoming	300,000 00	None.		14,717 00	145,788 00	15,035 00	888 00	8,087 97	22,228 00	217,641 97						
New Mexico	300,000 00	50.0														
Utah	300,000 00	All but yet received.		7,000 00	28,088 86	4,311 24	2,427 67	3,071 54	9,207 00	55,004 94						
				3,000 00	15,700 00	23,000 00	7,000 00	7,000 00	7,000 00	141,200 00						
				</												

* These figures, in cases of New York, Michigan and Ohio, shows present inventory value instead of amount actually expended for plant.
(a) Tax on fertilizers.
(b) Insurance policy.
(c) Income from U. S. under Morrill Act of 1890 for "Facilities."
(d) Income and New Morrill grant.
(e) Min. leg. price.
(f) 80 acres of land worth at present (1890) that price.
(g) Hatch grant.
(h) Funds of East Tennessee College (parent institutions).

TABLE II.—Income.

	PERMANENT FUNDS PRODUCING INCOME.				AMOUNT AND SOURCES OF INCOME FOR THE YEAR 1892.										TOTALS OF INCOME FOR FOUR PRECEDING YEARS.			
	Land Grant of 1892.	Other Land Grants.	Other Funds.	Interest on Land Grant of 1892.	Interest on other Funds.	From Hatch Act.	From Morrill Act of 1890.	State Appropriation—Annual.	State Appropriation—Occasional.	Tuition Fees of Students.	Incidental Fees.	Miscellaneous Sources.	Total Income for 1892.	1891.	1890.	1889.	1888.	
Alabama	\$233,500 00			\$20,280 00		\$15,000 00	\$27,103 00	(b) \$13,000 00			\$1,005 00	\$1,709 00	\$18,766 00	\$55,271 00	\$57,511 00	\$50,900 00	\$39,500 00	
California	711,005 44							(c) on the \$1.6 of mill.						236,431 57				
Colorado	44,881 94	(Endowment in 1892.)		6,794 22		15,000 00	17,000 00					1,049 89	76,930 92	60,000 00				
Florida	155,800 00			9,101 00		15,000 00	8,500 00				850 00		33,451 00	17,850 00	7,500 00	10,000 00	17,500 00	
Georgia	243,000 00			10,814 16			11,333 33							28,047 40	27,080 82	27,314 16	33,311 16	
Illinois	422,238 00			26,954 40		15,000 00	35,000 00	50,044 23	91.02.	\$76,000 00	11,807 42	381 78	92,231 60	222,687 20	51,370 00	129,210 00	36,000 00	
Indiana	340,000 00			17,000 00		15,000 00	18,000 00	30,000 00		\$12,340 00	2,584 00	2,000 00	96,924 00	107,305 00	80,300 00	120,411 00	65,117 00	
Iowa	500,105 10			38,820 54	\$5,591 10	15,000 00	18,000 00	3,500 00		36,489 31	3,111 00		120,518 00	153,171 12	79,045 14	70,501 87	72,271 00	
Kansas	502,927 35	\$8,679 51		20,053 83		15,000 00	17,000 00	11,055 42			92 25	7,111 23	76,012 73	60,770 87				
Kentucky—Agr. and Mech. College of Kentucky	165,000 00		(a)	9,000 00		15,000 00	15,300 00	33,547 90		4,307 21		2,072 65	81,207 85	101,125 50				
State Normal School for Colored Persons							4,128 34	3,000 00					7,128 34					
Louisiana							28,000 00	10,000 00				375 00	28,414 00	25,650 00	10,000 00	7,500 00	10,000 00	
Maine	131,300 00		100,000 00	5,305 00	4,000 00	15,000 00	18,000 00	10,000 00					54,645 00	81,645 00	13,705 00	47,000 00		
Maryland	110,000 00			6,142 30		15,000 00	17,000 00	6,000 00		4,599 72	(c) 1,013 00	(d) 1,380 00	31,174 02	50,700 00	19,151 00	33,107 33	57,112 30	
Massachusetts—Massachusetts Agricultural College	210,000 00			141,555 00	(11 00 00)	10,000 00	12,000 00	10,000 00		5,000 00	11,000 00	750 00	50,800 00	30,000 00	30,000 00	37,500 00	30,072 00	
Michigan	407,400 80			34,900 11		15,000 00	18,000 00	22,947 50		177 50	6,485 42	9,304 24	100,317 01	101,802 25	84,708 28	100,057 23	39,804 24	
Minnesota	+ 450,000 00	350,000 00		14,717 00	(18 15)	15,000 00	17,000 00	65,000 00		19,438 00		15,316 66	195,652 81	200,051 10	150,461 00	129,250 04	38,804 24	
Mississippi—Miss. Agr. and Mech. College	5,914 50			8,000 00		15,000 00	8,000 00	24,835 50		matriculation fees 600 00			54,500 00	54,078 37	54,078 37	38,478 75	38,478 75	
Alcorn Agr. and Mech. College	113,575 00			3,078 75		15,000 00	8,000 00	2,321 25		10,000 00			27,500 33	18,005 70	20,005 72	9,501 50	9,501 50	
Missouri	317,000 00			15,000 00		15,000 00	33,081 44	10,000 00					63,681 44	60,158 00	30,450 00	30,277 08	64,855 00	
Nebraska	(will be about 80,000 00)	\$1,000,000 00						% of mill		15,000 00								
Nevada								3,000 00										
New Hampshire																		
New York	473,402 87			18,000 00	200,023 03	15,401 00	17,000 00			94,945 00	19,514 01	10,094 83	408,800 20	321,133 48	301,217 08	302,303 83	329,411 19	
North Dakota	900,000 00			15,000 00		15,000 00							32,000 00	60,000 00	30,000 00	25,000 00		
Ohio	524,175 62	(e) 20,000 00		31,450 33	1,234 22		18,000 00	(f) 84,000 00		4,714 83	14,021 50	3,768 62	157,189 70	130,332 19	100,449 62	117,512 48	60,251 84	
Pennsylvania	427,200 50			25,637 43	5,382 57	15,000 00	18,000 00						51,502 70	80,887 70	94,302 50	81,674 47	62,450 04	
Rhode Island—Brown University	50,000 00			3,074 00	80,107 00		15,000 00			49,705 00	2,506 91	17,545 00	133,010 00	20,070 00	41,740 00	15,000 00		
Rhode Island—Agr. Experiment Station	7,400 00			5,700 00		15,000 00							14,700 00	14,700 00	14,700 00	14,700 00		
South Carolina	120,000 00			21,750 00	1,550 00	15,000 00	17,000 00	5,000 00		(1,000 00)	2,000 00		70,435 00	67,880 00	67,880 00	64,481 00	41,000 00	
South Dakota	183,500 00			10,829 56	13,105 68		15,000 00			(7,000 00)			121,713 76	119,518 27	32,135 18	51,011 00	37,294 00	
Tennessee	85,500 00			3,100 00	988 00		15,000 00			1,190 00	702 00	5,014 00	110,281 00	67,918 00	32,918 00	14,700 00		
Vermont	90,000 00			16,102 00		15,000 00	15,000 00			26,204 00	20,204 00		206,855 00	229,125 00	178,571 00	184,340 00	211,780 00	
West Virginia	300,000 00			1,301 50		15,000 00	15,000 00			241 00	205 45		101,281 00	67,918 00	32,918 00	14,700 00		
Wyoming		225,000 00					17,000 00	8,000 00		408 75		81 70	80,600 45	38,432 75	20,630 00			
New Mexico							18,000 00			108,000 00	1,405 00		228,200 00	70,000 00	70,000 00		25,000 00	
Utah																		

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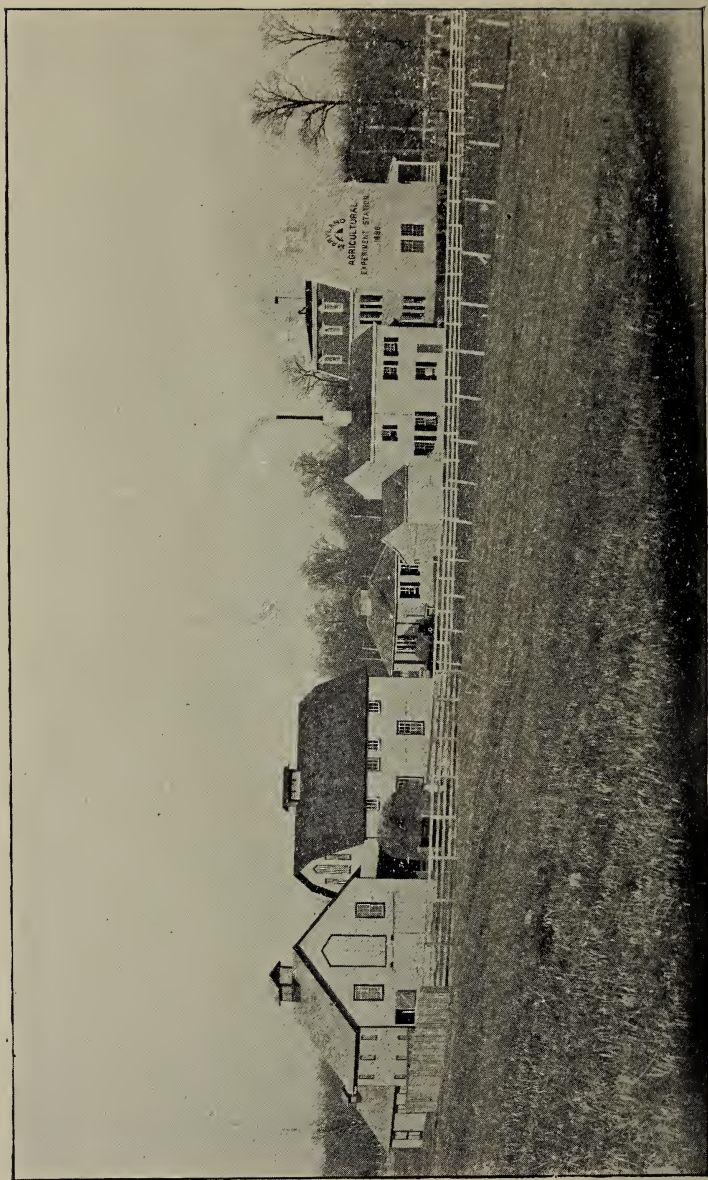
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MARYLAND AGRICULTURAL EXPERIMENT STATION BUILDINGS.

MARYLAND

Agricultural Experiment Station.

EIGHTH ANNUAL REPORT.

COLLEGE PARK, MD

1895

MARYLAND

Agricultural Experiment Station.

ADVISORY COMMITTEE OF BOARD OF TRUSTEES.

GOVERNOR LLOYD LOWNDES.....	Annapolis.
THE HON. SPENCER C. JONES.....	Rockville.
THE HON. MURRAY VANDIVER.....	Havre de Grace.
THE HON. DAVID SEIBERT.....	Clear Spring.
J. P. SILVER, Esq.....	Glenville.

OFFICERS OF THE STATION.

ROBERT H. MILLER.....	<i>Director.</i>
HARRY J. PATTERSON, B. S....	<i>Vice-Director and Chemist.</i>
JAS. S. ROBINSON.....	<i>Horticulturist.</i>
MILTON WHITNEY.....	<i>Physicist.</i>
SOTHORON KEY, B. S.....	<i>Assistant Physicist.</i>
ERNEST H. BRINKLEY.....	<i>Assistant Agriculturist.</i>
JOS. R. OWENS, M. D.....	<i>Treasurer.</i>
CHARLES W. RIDER.....	<i>Stenographer.</i>

Located on the B. & O. R. R., 8 miles N. of Washington, D. C.

NOTICE.

The bulletins of the Station will be mailed free to any citizen of Maryland who sends his name and address to the Station for that purpose.

Correspondents will please notify the Director of changes in their post-office address, or any failure to receive the bulletins.

ADDRESS,

MARYLAND AGRICULTURAL EXPERIMENT STATION,

COLLEGE PARK, MARYLAND.

College Park, Prince George's County, Md.

January 29th, 1896.

To His Excellency, Lloyd Lowndes,

Governor of Maryland :

DEAR SIR:—

In accordance with the provisions of Section No. 3, of Act of Congress, "To Establish Agricultural Experiment Stations, etc." I beg leave to submit my report of the operations of the Maryland Agricultural Experiment Station, for the year ending December 31st, 1895, and also a statement of the receipts and disbursements for the fiscal year ending June 30th, 1895, covering the eighth annual appropriation.

Very respectfully,

ROBT. H. MILLER,

Director.

EIGHTH ANNUAL REPORT

—OF THE—

Maryland Agricultural Experiment Station.

FOR THE YEAR 1895.

REPORT OF THE DIRECTOR.

Station Staff.—The only changes in the Station Staff during the past twelve months have been the election of Mr. H. J. Patterson, to the position of Vice-Director, and the vacancy in the chair of entomology caused by the very sudden death of Professor C. V. Riley. The loss of so eminent and experienced an entomologist will be keenly felt, not only in Maryland, but in other States where he was so well and favorably known. His thorough equipment for, and enthusiasm in his work made his connection with the Experiment Station, not only a matter of pride to those associated with him on the Station Staff, but they also realize that the services already rendered by him were highly appreciated by the people of the State, and that the completion of his outlined plan of work, to give the life history and habits of all the injurious insects of the State, with suggestions for their remedial treatment, would have reflected credit upon the Station, and would have been of great advantage to the agricultural interests.

Publications.—During the past year the following publications have been issued:

Jan., 1895, Seventh Annual Report.

Jan., 1895, Bulletin No. 30, Special Issue, Composition of Commercial Fertilizers sold in this State.

March, 1895, Bulletin No. 31, Potato Experiments.

April, 1895, Bulletin No. 32, The San Jose Scale.

April, 1895, Bulletin No. 33, Horticultural and Agricultural Departments. Small Fruits, Vegetables and Field Corn.

July, 1895, Bulletin 34, Special Issue, Composition of Commercial Fertilizers sold in this State.

September, 1895, Bulletin No. 35, Wheat, Barley, Oats and Hay Experiments.

December, 1895, Bulletin No. 36, Steer Feeding. A Well Balanced vs. Poorly Balanced Ration.

Permanent Improvements.—The dairy interest of the State has grown to such proportions as to demand recognition at the hands of the Station; this system of husbandry not only increases the fertility of the soil, but, at the same time, offers better opportunities for profit than many other branches of farming, and in order to encourage the industry we have deemed it proper to put into effect plans which we have enter-

tained for several years, which were to erect and equip a dairy building for experimental work in the handling of milk, butter and cream, and also a barn for the accommodation of cows. This department is in charge of Mr. H. J. Patterson, and will be more fully explained in his report which follows.

In addition to the above buildings, a tobacco barn has been erected for experimental flue curing of tobacco.

All of the buildings on the Station property, except the tobacco barn, have been thoroughly painted during the past season, by which the general appearance of the place is greatly improved. A permanent sheep pasture has been enclosed with a dog-proof fence, which was made necessary because of the frequent occasions on which the sheep were molested. All of the open ditches on the place, amounting to about one mile have been deepened and an addition alone opened through a piece of swamp land which has been cleared. This land embraces some four acres, and from having been in a very wild and totally unproductive condition has been thoroughly reclaimed, having been grubbed, drained and plowed, and will be planted to corn the coming spring and afterwards seeded down to permanent pasture.

Correspondence and Mailing List.—We are getting in closer touch with the farmers throughout the State as is evidenced by the increasing number of letters from them, making inquiry as to the various matters pertaining to their interests.

The number of those who receive our Bulletins has materially increased during the past year, we now have between six and seven thousand on our mailing list.

Visitors.—There have been more visitors to the Station during the past year than any previous one during which I have been connected with it. It has now become an established custom with many of the farmers' clubs in the State to pay at least an annual visit to the Station for the purpose of inspecting the work in progress here. Such delegations are especially welcome, for as a rule they represent the most intelligent and progressive of our rural population.

Fairs and Institutes.—For two years previous to this the Station has made an exhibit of its products at most of the fairs of the State, but the past season there were other matters of pressing importance which claimed our attention and it was thought best not to attend the fairs; but, as it is believed that much good may result to the farmer from the object lessons which are presented in this way, it will be our aim to exhibit at the fairs the coming year.

There is an increasing demand each year from different sections of the State for the officers of the Station to attend farmers' gatherings, such as clubs, conventions or institutes, and while it is our pleasure to aid the farmer in every way possible, the demand on our time is often excessive. Should a much needed Department of Farmers' Institutes be established in the State, it will be the means of relieving the officers of the Station of some of this work.

EXPERIMENTAL WORK, AGRICULTURAL DEPARTMENT.

Weather Report.—The season of 1895 has been no exception to the rule of the past three years of having a severe drouth during July and August. This drouth has interfered very seriously with some of the field experiments, more particularly with the fertilizer tests. Corn seemed to feel this lack of moisture less than any of our crops. This was probably owing to the fact that the land on which it grew had a heavy clover sod plowed down, which was thoroughly prepared with harrow and drag (a necessity in the event of having a drought to contend with); this rendered the soil exceedingly friable and gave the roots an opportunity of finding all of the moisture that was available.

The following is a summary of the rain-fall for this and preceding years at College Park.

YEARS.	1889	1890	1891	1892	1893	1894	1895
Rain-fall in inches.....	59.59	32.29	50.55	41.47	36.22	33.20	35.54
No. days on which rain fell	135	151	128	137	102	98	89

The following table gives a comparison of the rain-fall at College Park, Washington, Baltimore and Cumberland, together with the normal precipitation for those places. Also the normal temperature and the mean temperature for 1895, at the same places.

PLACE OF RECORD.	TEMPERATURE.		RAIN AND SNOW-FALL.	
	Normal.	Mean for 1895.	Normal in Inches.	In 1895 Inches.
College Park, Md.,.....	54.0	53.1	41.27	35.54
Washington, D. C.....	54.7	54.2	44.50	34.25
Baltimore, Md.....	55.5	54.2	44.18	40.47
Cumberland, Md.....	50.8	51.0	33.79	23.02

Wheat.—The experiments that have been made with wheat during the past year have been:

First, variety tests, twenty varieties having been seeded. In this test of varieties of wheat which has now covered a term of five years, it has been interesting to note the fact that the variety which for so many years has been the favorite one with the farmers of the State, the Fultz, still holds its place as being the wheat best adapted to this latitude. Another experiment has been testing the comparative profits of wheat

and barley. In this test the winter barley gave much the larger yield, but as this variety is not suitable for brewing purposes, it has to be thrown on the market as a feed, and the price it has commanded the past season would not justify its being sown as a substitute for wheat.

Potatoes.—We have followed out the same lines of investigation with potatoes as those reported last year. Many of the experiments with the late crop were very seriously interfered with by the extremely hot, dry weather which prevailed at the time the potatoes most needed moisture. The early crop on the contrary had to contend with excessive moisture, some of the varieties being badly drowned out, but those that made a good stand gave an excellent yield.

Tobacco.—The growing and curing of tobacco is under the supervision of the chemical department and will be reported under that head.

Crimson Clover.—Crimson clover has been quite extensively sown at the Station the past season, and notwithstanding the extremely dry weather, we have as a rule had excellent stands. When seeding it in corn we have followed the practice recommended in last year's report of sowing just ahead of the last working of corn, the cultivation being a shallow one, thereby covering the seed lightly.

The best stands which we have are after early potatoes and on land which grew a crop of tobacco. When plowed down for corn the past season it very materially increased the crop, as it did also a crop of potatoes. The coming year we will test its value in maintaining the fertility of the soil on land which will have been cropped in corn three years in succession. When purchasing seed it is very important to test its germinating power, as it often happens that bad seed is thrown on the market. As the price of crimson clover seed for the past two years has steadily declined there is no excuse for not sowing a liberal quantity—not less than twenty pounds to the acre should be seeded—and it should be the aim to sow as early in the season as possible so that the plant may become established before dry weather sets in.

Lime Experiments.—In addition to the experiments with lime referred to in the report of the chemical department, we have continued the one mentioned in the last annual report. This was the application of twenty bushels of stone lime on corn the spring of 1893, which increased the crop 38 per cent. The corn land was seeded to wheat and the increased yield of wheat the summer of 1894, was 37 per cent. The past season a crop of hay was harvested and the gain from the use of lime amounted to 91 per cent. The results of this experiment are very suggestive, and unfortunately only a relatively small proportion of farmers throughout the State are availing themselves of this most potential agent for increasing their crops and improving their soils.

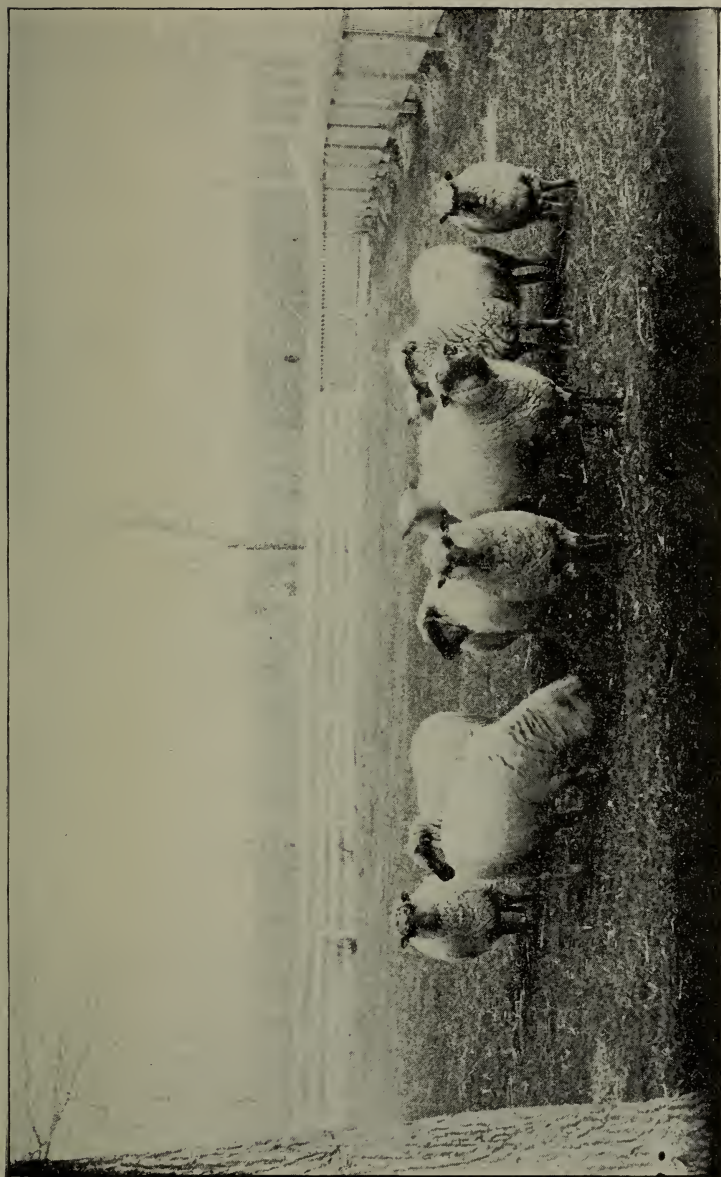
Feeding Experiments.—A feeding experiment was begun with steers the winter of 1893, which had for its object the testing of the relative profits of a well balanced and a poorly balanced ration, or more exactly speaking, the testing of the plain ration of corn and cob meal as

ordinarily used by cattle feeders, with a ration with corn and cob meal as a base, and to which some highly nitrogenous food has been added, so as to have it contain the essential constituents, in the proper proportions for the production of flesh and fat. This feeding test was repeated the winters of 1894 and 1895. Bulletin No. 36, reports the results of the last two feeding tests and gives a summary of the three. As is shown in the summary of results of the three years, the well balanced ration proved very much the more profitable.

Sheep.—The flock of imported Shropshire sheep mentioned in my last annual report as having been purchased for the Station, has done remarkably well the past year. Nine lambs were raised from the eight ewes; the buck lambs were sold to farmers for the purpose of grading up their flocks.

Before closing my report, I wish to express my sincere appreciation of the courtesy and support extended to me at all times by the Board of Trustees.

ROBERT H. MILLER, *Director.*



A FLOCK OF IMPORTED SHROPSHIRE SHEEP.

REPORT FROM THE CHEMICAL DEPARTMENT.

To the Director :

SIR:—The work carried on in the Chemical Department during the past year has, in the main, been similar to that of the year previous with the addition of the proposed experiments which were outlined in my last report.

Dairy Experiments.—In June you requested me to submit plans and specifications, with estimates, for a dairy building and equipping the same, to be presented to the Board of Trustees for their consideration, and in September you requested a plan for a cow-barn for the same purpose. These plans met the approval of the Board, and you delegated me to receive bids and superintend the carrying out of the details of the work of building and equipping the department and also to take charge of the department and conduct the dairy experiments after all was complete.

I am pleased to report that this work has been completed and that we now have a dairy and dairy-herd which will give us ample facilities for conducting experiments of interest to dairy farmers, and so meet a long felt want and a constantly increasing demand. Our equipment consists of a creamery building containing main work-room, an ice house, a refrigerator, an engine room, a milk testing room, a room for cleaning and washing utensils, an office and a vestibule. In this building we shall have the necessary apparatus for conducting work upon a practical basis according to the most modern and approved methods; and at the same time, have facilities for testing new apparatus or methods as they are offered. In this work my aim will be to study the creamery problems and feeding questions upon a basis directly applicable to Maryland conditions.

The cowstable is fitted up with a variety of stalls and cattle ties illustrating the most modern and approved methods in this line.

I append, herewith, photographs of these buildings, giving exterior and interior views, also drawing showing the floor plans.

Tobacco Work.—The experiments with tobacco have been a continuation of those of previous years in regard to curing and variety tests; in addition some fertilizer tests of a somewhat different character from those previously conducted have been carried on. Root washings of the tobacco plant at different stages of growth have been made and photographs of the same taken so as to show the relative amounts and development of that part of the plant above and below ground. There is still considerable laboratory work to be done with this year's crop before any results can be given.

Meteorological Records.—This work has been conducted precisely the same as outlined in my last report. A summary of this year's data is appended herewith.

Farmers' Meetings and Correspondence.—During the year, as in previous years, I have attended a number of farmers' meetings, institutes, clubs, granges, etc., and given talks on subjects relative to farm operations. It has always been the aim in these talks to show how chemistry was helping to solve the whys and wherefores that confronted the farmer and to show in a practical way how the latest results of research could be applied to the every day operations of the farm. These meetings draw on my time to a marked degree and break in upon the home work considerably; yet, I believe, it is time well spent, as we are enabled by such methods to get our results before the farmer in the most intelligible form, and at the same time find out what the farmers are thinking about and what questions are of the most interest to them, and should demand our attention in Station work.

The correspondence of this department is constantly increasing and, in the most part, consists of inquiries relative to fertilizers, feed stuffs and dairying, and at the present time it requires at least the equivalent of one day a week to answer such letters.

Phosphoric Acid Experiments.—Last spring I inaugurated, with your approval, a series of experiments with phosphoric acid. The object was to test the availability of different forms of phosphoric acid, and methods for rendering insoluble phosphoric acid available in the soil. The first crop grown in this test was corn. The results will be forthcoming. The following is the programme of the treatment of the several plots:

PHOSPHORIC ACID EXPERIMENT.

Plots One-Tenth of an Acre Each.

Plot No.	KIND OF FERTILIZER AND TREATMENT.	QUANTITY.* PER PLOT.	QUANTITY PER ACRE.
	<i>Crimson Clover Seeded in Corn.</i>	Lbs.	Lbs.
1	Double Superphosphate (Soluble $P_2 O_5$)..	32	319
2	Dissolved Bone Black (Soluble $P_2 O_5$)....	73½	735
3	Dissolved S. C. Rock (Soluble $P_2 O_5$).....	100	1000
4	Double Superphosphate (Reverted $P_2 O_5$)	37	370
5	Nothing.....
6	Iron Alumina Phosphate (Reverted $P_2 O_5$)	37	370
7	Bone Black (Insoluble $P_2 O_5$).....	51½	514
8	Raw Bone Meal (Insoluble $P_2 O_5$)	66½	667
9	Slag Phosphate (Insoluble $P_2 O_5$).....	92	920
10	Nothing.....
11	Ground S. C. Rock (Insoluble $P_2 O_5$).....	53	530
12	Florida Soft Phosphate (Insoluble $P_2 O_5$)	56	560
	<i>Ground Left Bare During Winter.</i>		
	<i>No Green Crop Turned Under.</i>		
13	Same as No. 8.....	66½	667
14	Same as No. 9.....	92	920
15	Nothing.....
16	Same as No. 11.....	53	530
17	Same as No. 12.....	56	560
	<i>Rye Seeded on Corn Ground.</i>		
18	Same as No. 8.....	66½	667
19	Same as No. 9.....	92	920
20	Nothing.....
21	Same as No. 11.....	53	530
22	Same as No. 12.....	56	560

*These Quantities give each Plot the same quantity of Phosphoric Acid, (150 pounds per Acre).

The land was in wheat in 1889; grass, 1890-91; corn, 1892; fallowed, 1893, and in wheat 1894—clover and timothy seeded in wheat and gave a good set.

Plots were numbered commencing at end next Experiment Station building toward Paint Branch.

Lime Experiments.—A series of plots for some special lime experiments was laid out last spring and planted to corn. The following is an outline of the scheme adopted.

LIME EXPERIMENTS.

Size of Plots 10 Feet by 67 Feet—2 Ft. Space.

Plot. No.		QUANTITY.	
		Per Acre.	Per Plot.
		Lbs.	Lbs.
1	Stone lime (Calcium Oxide) freshly slacked and applied as a top dressing.....	1400	20
2	Stone lime (Calcium Oxide) freshly slacked and thoroughly worked into the soil immediately...	1400	20
3	Oyster shell lime (Calcium Oxide) freshly slacked and thoroughly worked into the soil.....	1400	30
4	Oyster shell lime (Calcium Oxide) worked into the soil before slacking.....	1400	30
5	Magnesium Oxide.....	1400	25
6	Barium Oxide.....	1400	20
7	Nothing.....		
8	Shell marl (Calcium Carbonate).....		200
9	Finely ground oyster shells (Calcium Carbonate)..		40
10	Gypsum (Calcium Sulfate).....		65
11	Gas-house lime (Calcium Sulfate).....		45
12	S. C. Rock (Calcium Phosphate).....		45
13	Coal ashes.....		200
14	Commercial Fertilizer { Double Superphosphate 200 { Tankage..... 100 { Sulphate of Potash..... 80	380	5½

(Plots numbered from road toward the south.)

Co-operative Chemical Work.—As “Reporter on Foods and Feed Stuffs” for the Association of Official Agricultural Chemists, and in continuance of the policy of former years, I have devoted some considerable time to the study of methods of analysis. My report for 1895, has been printed in the proceedings of the above named association. In this capacity I have made a special effort to improve our methods of analyses of cattle foods so that the results would be more tangible and give a better and clearer idea of the real value of food, especially of the carbohydrate compounds. In addition to the work on foods, I have taken part in the work of some of the other reporters of the A. O. A. C. For the coming year, I have been appointed one of the abstracters of chemical literature for the A. O. A. C. These abstracts will be published in the Experiment Station Record.

Miscellaneous Chemical Work.—The demands on this department for analyses of a miscellaneous character are constantly increasing, and whenever the samples so sent in are either of public interest, or have some direct bearing on agriculture or horticulture, they are examined gratuitously. Yet, even with these considerations in mind, many of the samples which I have examined are of interest to so few that the results

of their analyses are not worthy of publication, and, in fact, they almost belong to that class of analyses which were done yesterday, reported to-day and to be forgotten to-morrow; consequently, I do not believe that it would be justice to the public or the Station to expend much time on such a class of substances, therefore I reserve the right to select for examination such as in my judgement are of most general interest and permanent value. Considerable time has been expended in studying methods of analysis applicable to our special lines of work. The study of methods is a class of work that does not come directly in touch with the farmer and his operations and consequently does not appeal to him, and he is prone to think of it as a waste of time and money; nevertheless, on a moment's reflection, it will be apparent to all that it is a very necessary part of Station work. In fact, in the planning of an investigation, it is of paramount importance to be sure that the methods to be employed in the carrying out of that investigation are thorough and scrutinizing so that the results obtained may be beyond reproach.

Laboratory and Equipment.—The laboratory remains substantially the same as indicated in my last report. There has been but little added to the laboratory equipment; the only thing of any special consequence being an autoclave or apparatus for heating under high pressure.

In closing, permit me to assure you of my appreciation of the many courtesies and hearty support which you have given me and my department.

Yours respectfully,

H. J. PATTERSON,

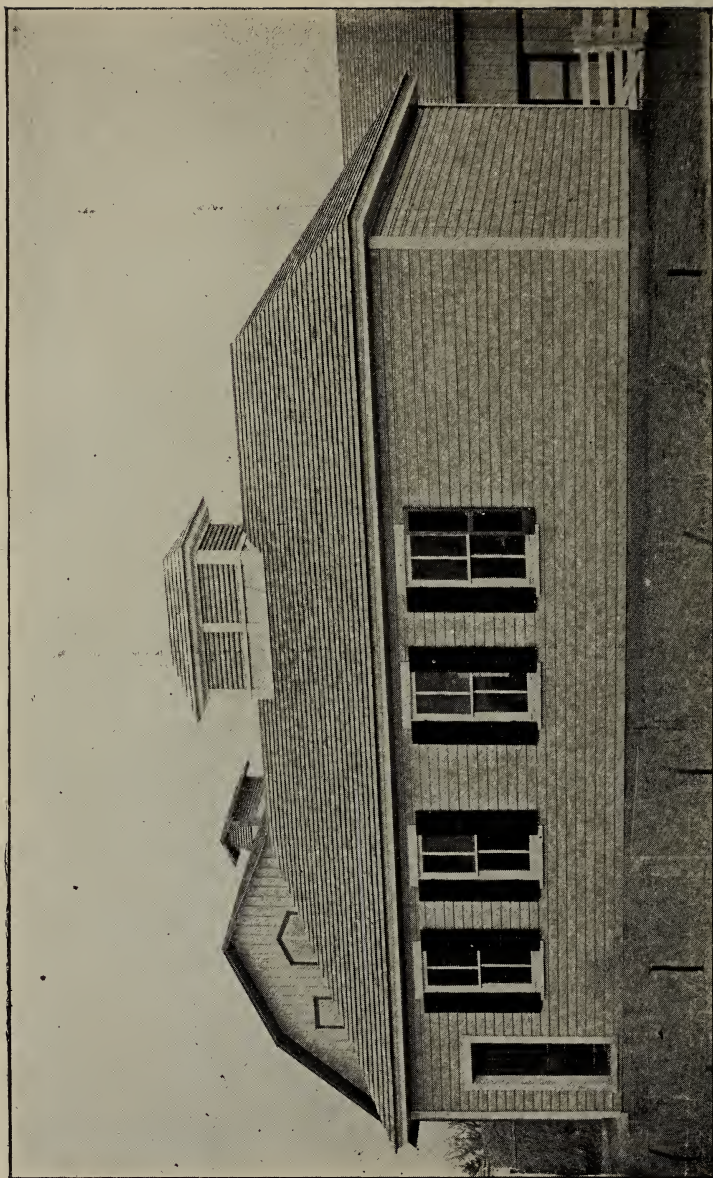
December 31, 1895.

Chemist.

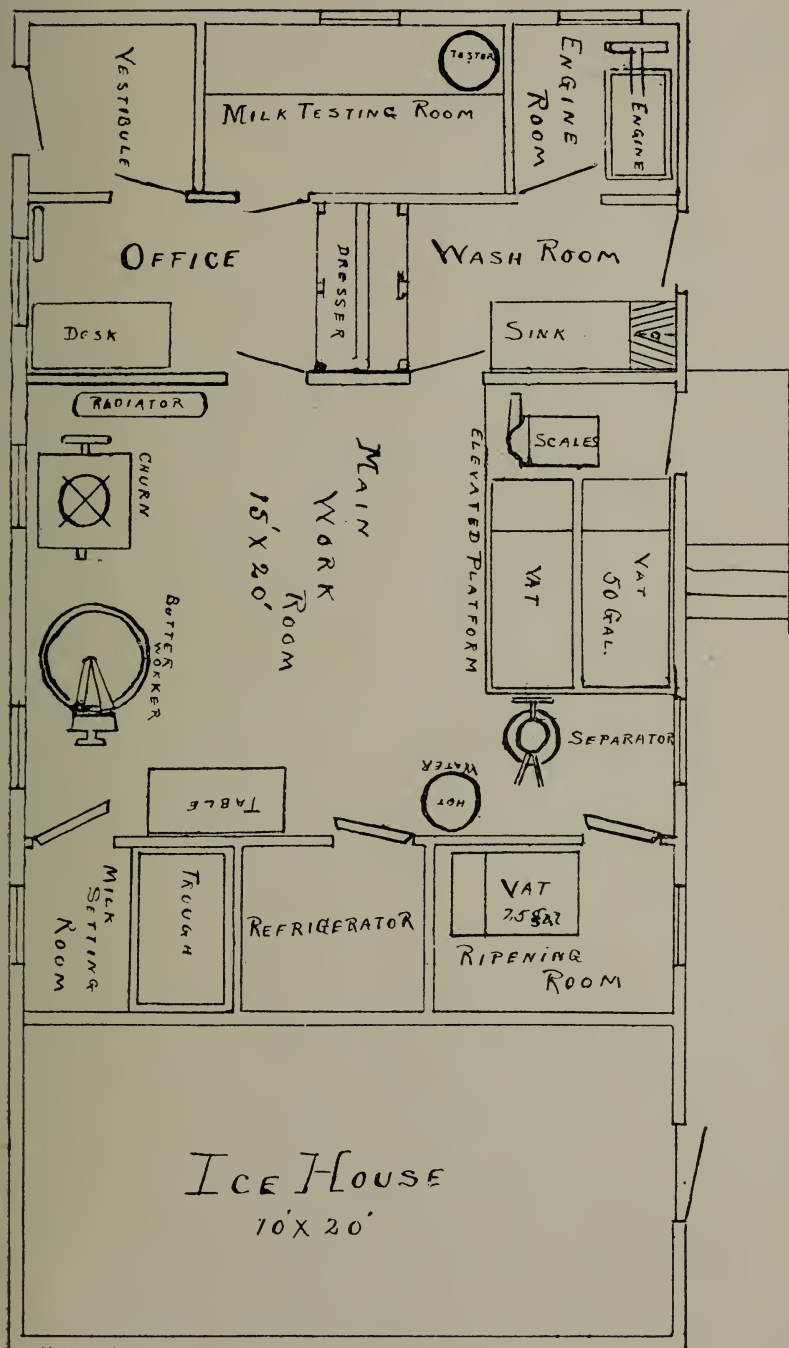
METEOROLOGICAL SUMMARY FOR 1895.

Temperature in Degrees—Fahrenheit.

MONTH.	Pre- cipita- tion. Inches	TEMPERATURES—MEAN.				Extreme Maximum.	Extreme Minimum.
		Daily Mean.	Maxi- mum.	Mini- mum.	Daily Range	Record and Date.	Record and Date.
January.....	3.79	29.6	38.2	20.5	17.7	49-22nd	10 25th
February.....	0.70	24.9	34.9	14.4	20.5	57-27th	7-3rd
March.....	2.73	40.5	51.4	31.4	20.0	72-1st	20-6th
April.....	5.84	52.1	62.8	40.6	22.2	85-25th	26-4th
May.....	3.16	61.0	71.9	49.3	22.6	94-30th & 31st	37-17th
June.....	5.50	72.3	83.9	61.3	22.6	100 2nd	48-8th
July.....	2.27	71.0	82.2	60.1	22.1	99-22nd	50-31st
August.....	2.57	77.6	89.2	63.1	26.1	98-11 & 29th	47-1st
September.....	1.81	70.2	85.5	59.3	26.2	101-23rd	44-15 & 28th
October.....	1.89	51.4	66.8	34.8	32.0	77-3, 19 & 27th	26-30th
November.....	1.96	47.1	58.7	38.3	20.4	78-9th	23-29th
December.....	3.32	39.9	49.2	32.0	17.2	69-23rd & 26th	17-4, 13 & 14th
Yearly.....	35.54	53.1	64.6	42.1	22.5	101	7



MARYLAND AGRICULTURAL EXPERIMENT STATION CREAMERY.



FLOOR PLAN OF THE MARYLAND AGRICULTURAL EXPERIMENT STATION CREAMERY.

REPORT OF THE DEPARTMENT OF HORTICULTURE.

To Robert H. Miller, Director :

SIR:—I herewith have the honor to submit a summary of the character of the work of this department.

The farmer of Maryland to-day in whatever field of general or special interest, requires for his proper equipment the fullest information along the lines of practical fact relative thereto to enable him most successfully to meet the changing conditions of lower values resulting from larger productions, sharper competition, and ease and rapidity of transportations. This general statement of fact is especially true in regard to the horticultural interest; since, while the expectation of acreage profit might be legitimately larger, the cost of preparation, planting, handling and marketing this line of production is largely in excess of the gross returns from any of the other fields of staple agricultural pursuit. The continuing low price of these staples is constantly recruiting the ranks of those hoping for a better opportunity; the venture often resulting in disappointment. Want of knowledge as to adaptation of varieties, to soil and location, market demands, proper methods of pruning, culture, remedial and preventive measures as to fungus and insect pests, are not unfrequently responsible for this result.

An appreciative desire for fuller information along these indicated lines is evidenced by the largely increasing correspondence with the Station, and requests from time to time to visit different sections of the State and give public lectures on the results of Station work as applicable to the special local interest. These requests as far as time and opportunity would permit have always been complied with.

Horticultural Association.—I will take this opportunity of commending to the attention of the fruit growers of Maryland two facts which I regard as of especial importance to the fruit interest.

One is their need of a State Horticultural Association, which would afford a means through which most valuable information, results of experience and skill could be rapidly and widely disseminated for the information and benefit of those specially interested in this line of work. This instrumentality has accomplished splendid results in other States. The Peninsular Horticultural Association is doing good work in a section of this State. This opportunity ought to cover a larger field and be productive of larger results. The horticultural interest in Maryland is now relatively larger than in any State in the Union, and yet we have no State Association. We have exceptional advantages of climate, soil and location, but these need the supplement of the latest information and best instrumentalities.

San Jose Scale.—Another fact I desire to specially emphasize is the presence and spread of the San Jose scale insect. This promises to be the worst pest of them all and a menace to the whole fruit interest. The seriousness of this invasion is due to the fact of the rapidity of its multiplication, destructive effects, cost and difficulty of getting rid of it and the wide range of its food supply, having been found not only on the apple, pear, peach, quince, cherry, currant, gooseberry and raspberry, but also on the persimmon and pecan. As the invasion is of recent years and still confined to the fruits of certain localities, introduced in every case, so far as known, through the purchase of nursery stock, the

effort to stamp it out could be made more effectual than if deferred to a later period. I would suggest in view of the importance of the interests involved the propriety of legislative enactments for the accomplishment of this purpose.

Tomato Blight.—The tomato is largely grown in this State for commercial purposes either to meet the immediate market demands or as an item of interest in the canning industry. For a number of years a blight affecting the foliage of the tomato has been more or less prevalent in different localities. The past season it seems to have been almost universally prevalent.

The trouble is referable to the presence of one of the parasitic fungi resulting in the destruction of a large part of the foliage at a critical period in the growth of the plant, and thereby very injuriously affecting both the quantity and quality of the crop. The suggested preventive is the early and proper spraying with Bordean and ammoniacal copper solution.

Strawberries.—The interest in the cultivation of the small fruits as a market enterprise is steadily increasing. This is particularly true of the strawberry. The climatic conditions the past year generally were not as favorable for the marketing of the Maryland crop as the season of 1894. The bulk of the Maryland crop finds sale in the Northern markets filling the interval between the falling off of the Southern berries and their own local supply. That interval was shorter this season than ordinary for two reasons. In many sections of our State the early berries suffered badly from late frosts, while the mild winter and early spring hastened the ripening of the Northern crop.

At the Station 145 varieties were in fruitage. The land upon which these were planted was heavy and late, consequently escaping the frosts which caught the earlier bloom in other sections. The crop was exceptionally fine, both as to quality and quantity.

Variety Tests and Fertilizer Experiments on the Eastern Shore.—In deference to the requests of a large number of growers that variety tests and fertilizer experiments should be made upon soils more generally approximating in physical character the lands generally devoted to this crop in the State than those found at the Station, an arrangement was made with Mr. Wm. F. Allen, Jr., of Wicomico Co., to conduct this experiment under the Station's direction. Fifty of the leading varieties were set and the fertilizers applied as directed. The plan as outlined was faithfully carried out with every promise of success for the ascertainment of facts which we hoped would be of public advantage. The character of the land upon which the experiment was conducted is generally what is known as the early truck lands of the State. Most of the varieties here were in full bloom at the time of the late frost. The crop was damaged to such an extent, both in quantity and quality as to leave unsettled many points of investigation which we had hoped would be of special interest. As the most profitable growing of the strawberry is generally on this character of land, I would recommend a continuance of the experiment on the same lines and on similar soils.

Very respectfully, JAS. S. ROBINSON, *Horticulturist.*

REPORT OF PHYSICIST.

To Robert H. Miller, Director :

DEAR SIR:—I have the honor to submit, herewith, a report upon the work of this department of the Maryland Experiment Station for the past year.

There have been collected up to this time 577 samples of soils from Maryland. Of this number 221 samples have been analyzed, representing this number of different localities. This collection represents all of the important geological formations and the principal agricultural areas of the State. In addition to this a large collection of the soils of Virginia have been made during the past season, and samples from 161 localities in that State have been analyzed. This work was done through the co-operation of the Virginia Board of Agriculture with the U. S. Department of Agriculture. As the soil formations are the same as those in Maryland, very important light has been thrown upon the soils of Maryland by these investigations of the soils of Virginia. Furthermore the U. S. Department of Agriculture has made an important series of investigations, during the past season, upon the texture and moisture conditions of some of the principal soil formations of the Atlantic Coast States, of which there is a representative of every kind in Maryland, owing to the great variety of geological formations, and this work likewise has an important bearing upon the soil conditions of the State.

During the past year a large number of soil samples, representing the principal agricultural areas of the Eastern Shore, have been examined. This work has been rendered more difficult as there is little reliable knowledge of the distribution of the geological strata of that part of the State.

The most recent investigations confirm the statements which have been made in previous reports that the distribution of crops and of agricultural interests in Maryland are very largely caused by the difference in the texture of the soils and the difference in the conditions which these soils maintain, principally in regard to the amount of moisture they maintain for the use of crops.

I have before called attention to the close similarity between the texture of the soils and the amount of soil moisture in the truck soils of Maryland and in the bright tobacco soils of Virginia and North Carolina. Many of our truck soils, which, for lack of transportation facilities, have little value for truck farming, could probably be very profitably devoted to this bright tobacco industry. It is essential of course that the proper methods of cultivation should be used and that the crop should be cured in a proper manner. The soil conditions simply produce a plant which will assume under certain conditions of curing the bright golden or mahogany color which is so desired.

It is a well recognized fact now that the different classes and types of tobacco require different soils differing greatly in their texture and especially in the amount of water supplied to the crops.

The investigations of the United States Department of Agriculture of the texture and physical properties of the principal tobacco areas are throwing an important light upon this subject. The Havana tobacco, the Sumatra type of wrapper leaf grown in the Connecticut Valley, the white burley tobacco of Ohio and Kentucky, adapted to the English, German, Italian, Austrian, Swiss and Spanish markets; the pipe, chewing and cigarette tobaccos of Virginia and North Carolina, are each grown upon soils having certain physical properties due to the difference in the texture or structure of the soils. Some of these types have already been very fully worked out by the department, and with the work which has been done upon the soils of Maryland, it is believed that it will be possible now to point out which soils are adapted to any one of these several types of tobacco provided the climatic conditions are favorable. There are so many factors, however, which enter into the successful and economical production of a crop in the soil, climate, methods of cultivation and treatment that all innovations in the introduction of crops from widely separated localities should be commenced with extreme caution by experimenting on a small scale in actual field work.

Specialization has gone so far in agriculture, as it has in various other industrial lines, that our farmers can no longer expect to succeed unless they closely watch the markets and adapt their crops to the requirements of the markets. There is no single crop in which this specialization has been carried further than with tobacco. This has been brought about by the demands of trade, and has been met by the development of well-marked commercial types of tobacco originated through the selection of seeds and of soils. The mongrel type of Maryland tobacco of thirty or forty years ago, marketed with little regard to the seed or soil, would have little chance in the markets of the world to-day. Every tobacco planter should consider first, what types of tobacco are required in domestic or foreign markets, and secondly, which of these classes or types his soil and local conditions of climate are adapted to produce.

Work has been started on a study of the changes which have taken place in some of the worn-out tobacco soils of Southern Maryland, but our methods are not yet sufficiently developed to warrant much field work in being done. The same is true of the investigations which have been commenced in the study of the causes of the unfertility of the soils of the Potomac formation and of the "white oak lands" of the Eastern Shore.

Observations have been made during a part of the growing season in some of the principal soils of the State, of the amount of moisture they maintain for crops, but not so much work of this kind has been done this season as we hoped to do. It is difficult to find observers willing to do the necessary work involved in taking daily samples of soil, located on the typical soils which it is desired to study. It is hoped that more of this work can be done during the coming season.

Very truly yours,

MILTON WHITNEY,

Physicist.

JAN 8 1931

UNIVERSITY OF MARYLAND

THE ANNUAL FINANCIAL REPORT, 1894-1895.

The Maryland Agricultural Experiment Station in Account With the United States.

1894.						Dr.
July 1,	To cash unexpended of this date.....	\$	394.07			
1895.						
June, 30,	To receipts from the Treasurer of the United States in four payments, per appropriation for the year ending June 30, 1895, under Act of Congress, approved March 2, 1887.....		15,000.00			
June, 30,	To cash from sale of produce.....		299.89			
April, 6,	To cash from Allemand & Gallagher Insurance.		274.38			
April, 20,	To cash from sale of beeves.....		473.88			
						\$16,442.22
1895.	NATURE OF EXPENDITURES.					Cr.
June, 29,	By cash paid salaries	\$8,055.26				
" 29,	" " " labor	2,125.19				
" 29,	" " " publications.....	1,661.36				
" 29,	" " " postage and stationery..	140.21				
" 29,	" " " freight and express.....	218.43				
" 29,	" " " heat, light and water....	345.30				
" 29,	" " " chemical supplies.....	59.17				
" 29,	" " " seeds, plants and sundry supplies.....	291.30				
" 29,	" " " fertilizers.....	225.36				
" 29,	" " " feeding stuffs.....	264.03				
" 29,	" " " library.....	70.11				
" 29,	" " " tools, implements and machinery.....	331.39				
" 29,	" " " furniture and fixtures..	92.67				
" 29,	" " " scientific apparatus.....	41.10				
" 29,	" " " live stock.....	581.64				
" 29,	" " " exhibitions and meetings	483.05				
" 29,	" " " contingent expenses.....	15.25				
" 29,	" " " buildings and repairs....	825.06				
" 29,	" " " balance.....	616.34				
						\$16,442.22

I hereby certify that the foregoing is a true transcript from the books of account of the Maryland Agricultural Experiment Station.

JOSEPH R. OWENS, Treasurer.

We, the undersigned, duly appointed Auditors for the corporation, do hereby certify that we have examined the books and accounts of the Maryland Agricultural Experiment Station, for the fiscal year, ending June 30, 1895, that we have found the same well kept and correctly classified as above, and that the receipts are shown to have been \$16,442.22, and the corresponding disbursements, \$15 825.88. Vouchers for this disbursement are on file, and have been examined by us, and are found correct, thus leaving an unexpended balance of \$616.34, to be accounted for by the treasurer in the fiscal year commencing July 1, 1895.

(Signed.)

CHARLES B. CALVERT, { Auditing Committee
J. P. SILVER, { Board of Trustees.



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